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The Development and Validation of the Supportive Other Experiences Questionnaire: Integrating the Perspectives of the Social Support Provider After Traumatic Injury

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THE DEVELOPMENT AND VALIDATION OF THE SUPPORTIVE OTHER EXPERIENCES QUESTIONNAIRE: INTEGRATING THE PERSPECTIVES OF THE SOCIAL SUPPORT PROVIDER AFTER TRAUMATIC INJURY

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ABSTRACT

Social support is considered to be a protective factor against the development of PTSD after trauma. However, examinations of the social support-PTSD relationship have relied primarily on the self-reports of trauma-exposed individuals to the exclusion of their support providers. A new measure, the Supportive Other Experiences Questionnaire (SOEQ) was developed based on social support theory, prior research and psychometrics in order to capture important components of social support from the perspective of the support provider. Concerned Significant Others (CSOs) recruited via Amazon's Mechanical Turk (MTurk) platform who served as support providers to a traumatically injured romantic partner were recruited to respond to SOEQ candidate items and other relevant measures of psychopathology and relational factors. Confirmatory factor analytic results of SOEQ candidate items provide evidence for three social support subtypes (i.e., informational, tangible, and emotional) and two social support processes (i.e., provision frequency, provision difficulty). Evidence of convergent and discriminant validity provide good psychometric support for the measure. Evidence of construct validity was derived from support for two hypotheses: (1) Difficulty providing social support is negatively associated with support provider perceptions of trauma survivor recovery, (2) Social support provision frequency is positively associated with relationship satisfaction.

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INTRODUCTION

Exposure to traumatic events places individuals at heightened risk for the development of PTSD, among other forms of posttraumatic psychopathology (Bryant, 2010; Kessler et al., 2005; Price & van Stolk-Cooke, 2015). The *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)* defines a *traumatic event* as one involving actual or threatened death, serious injury, or sexual violence, and *traumatic exposure* as direct exposure or witnessing the event as it happened to another person (APA, 2013). Among those individuals who are exposed to traumatic injury, defined as a traumatic event resulting in physical injury, 23% will meet criteria for PTSD within the following year (Zatzick et al., 2007). Although a majority of individuals will be exposed to a traumatic event within their lifetime, most recover. PTSD, along with several other trauma and stressor-related disorders in the DSM-5, is therefore conceptualized as a disorder of non-recovery from these events (Rothbaum et al., 2012).

Social support, or the assistance an individual receives from others in times of need (Ozbay et al., 2007), is considered to be a protective factor against the development and maintenance of many mental health disorders (Harandi, Taghinasab, & Nayeri, 2017). In the context of traumatic events, social support has long been considered prophylactic against PTSD. Indeed, the Psychological First Aid Field Operations Guide published by the National Center for PTSD identifies social support as "critical to recovery" (Ruzek, Brymer, Jacobs, Layne, & al, 2007). As a result, the relation between social support and the onset and course of PTSD is examined frequently (Adams et al., 2018; Lehavot et al., 2018; Simon, Roberts, Lewis, van Gelderen, & Bisson, 2019), and evidence-based treatments for PTSD have emerged that attempt to harness the benefits of

social support in promoting positive treatment outcomes (Cloitre, Jackson, & Schmidt, 2016; Monson et al., 2011).

The concept that social support serves a protective role for trauma survivors is derived from a large and primarily cross-sectional evidence base. A meta-analysis examining risk and protective factors for PTSD yielded a moderate effect size (using Fischer's *r*-to-*Z* transformation) of the relationship between social support and PTSD of -0.28, indicating that elevated levels of support were associated with reduced PTSD symptom severity, while lower levels of social support were associated with greater PTSD symptom severity. A moderate effect size of 0.26 between social support and mental health was found in a meta-analysis of perceived and received social support provided to first responders in the aftermath of potentially traumatic events. In their examination of the mechanisms of the relation between PTSD symptoms and a latent variable that included social support, unit cohesion and trait resilience in military personnel, Zang and colleagues (2017) found that social support was negatively associated with PTSD symptom severity, and that this relationship was fully mediated by posttraumatic cognitions. They concluded that social support, unit cohesion and trait resilience collectively alleviated PTSD symptom severity by diminishing negative trauma-related thoughts. A study examining social support for veterans with comorbid PTSD and substance use disorders (SUDs) found that social support was negatively associated with PTSD symptom severity when controlling for SUD symptoms as expected, but positively associated with SUD symptom severity (Gros et al., 2016). Specifically, veterans who reported higher levels of social support were more likely to report less severe PTSD symptoms, but were also more likely to report more alcohol use.

The authors of this study suggested that this surprising finding might be attributable to the fact that their sample of veterans was younger than those previously studied in examinations of the relation between social support and substance use.

Recent work has also highlighted that some traumatized populations are especially vulnerable to PTSD symptoms when faced with inadequate social support. For example, Weiss, Garvert and Cloitre (2015) examined the effects of perceived social support on PTSD in sexual minority and sexual nonminority women, finding a buffering effect of high social support for both groups, but a more detrimental effect of low social support for sexual minority women. Collectively, these projects have pointed to a negative relation between PTSD symptom severity and social support, such that when social support is high, PTSD symptoms are likely to be lower.

PTSD and Social Support Erosion

As in all the cases mentioned above, the majority of research examining the relation between social support and PTSD has been cross-sectional. Ozer and colleagues (2003) indicated that the strongest effect sizes for the negative relation between PTSD and social support were found in cross-sectional studies in which at least three years had elapsed between the traumatic event and the study procedures. From this, they concluded that the protective effects of social support are likely to become more pronounced over time as support accumulates. This conclusion, however, presumes an understanding of the longitudinal relationship between these latent variables that was not available at that time.

The longitudinal literature on social support for PTSD has suggested a different relation between the two variables. Specifically, longitudinal work indicates that the

quality and quantity of social support diminishes, or *erodes*, as a function of posttraumatic symptom severity and corresponding impairments. For instance, a study of Gulf War veterans with PTSD indicated a strong negative relation between PTSD symptom severity two years posttrauma and social support five years later, whereas high levels of social support two years posttrauma were not related to PTSD symptom severity five years later (King, Taft, King, Hammond, & Stone, 2006). Another study examining trauma survivors in the acute posttrauma period (i.e., <1 month posttrauma) found that PTSD symptoms predicted diminished social support at subsequent time points, but did not find the reverse relation (Price, Evans, & Bagrow, 2014). Fredman and colleagues (2016) found that more severe PTSD symptoms in the month following a motor vehicle accident were predictive of more dysfunctional communication patterns in intimate relationships three and a half months posttrauma, while functional communication was not predictive of less severe PTSD symptomology. A longitudinal study of 1132 traumatically injured hospital patients revealed that more severe PTSD symptoms predicted increased "negative" social support (e.g., making demands, criticizing, initiating arguments) and decreased "positive" social support over 6 years posttrauma (Nickerson et al., 2017). Kaniasty and Norris (2008) found support for both the buffering hypothesis, in which social support leads to less PTSD, and the erosion hypothesis, in which PTSD symptoms deteriorate social support. Specifically, they observed that these trajectories were temporally sequential, such that the buffering effects were apparent earlier in posttrauma recovery, while the erosion effect appeared several months posttrauma.

Collectively, these longitudinal projects suggest that PTSD symptomology may in fact alter the quantity and quality of social support that trauma survivors receive over time. This literature constitutes a reminder, however, that the relation between the social support and PTSD is bidirectional. Thus, the functioning of the social support provider likely exerts a strong influence on how support is provided and received by the trauma survivor. And yet, across all of these studies, the perspective of the provider has not been accounted for.

Defining Social Support

Social support is a construct that has been studied extensively across multiple subdisciplines of psychology (e.g., clinical, social, developmental) for many decades (Cassel, 1976; Cobb, 1976). Over time, experts in each relevant domain have formulated their own definitions for social support. Underlying all, however, has been the recognition that support offered and received has the power to influence outcomes of import to society, such as physical and mental health and community wellbeing (Sarason & Sarason, 2009). Cobb (1976) defined social support as a construct involving three components: (1) information indicating that an individual is cared for and loved, (2) information indicating that an individual is esteemed and valued, and (3) information indicating that an individual is a recognized member of a community or social network. These defined support types have since evolved, such that there are often multiple labels for the same construct. For example, Cutrona & Suhr (1992), describe five unique support types to be measured observationally, including *emotional support,* defined as an expression of care, concern and/or sympathy, *esteem support,* defined as reassurance of worth, expressions of liking and/or confidence, *network support,* defined as the

promotion of social connection or reassurance of the target's belonging in a community, *informational* support, defined as information- or advice-giving, and *tangible support*, defined as physical or material intervention or aid (Table 1). By contrast, Cohen, Underwood & Gottleib (2000) describe only three support types: instrumental support, which is synonymous with tangible support, emotional support, and informational support. In their measure development project, Nick and colleagues (2018) presented a stem-and-leaf plot of literature supporting various subtypes of social support, finding the greatest support for a combined esteem/emotional support subtype, social companionship (i.e., network support), informational, and instrumental (i.e., tangible) support.

Table 1.
Social Support Types, Alternative Names, and Definitions

Support Type	Definition	Alternative Name
Emotional	Expressions of care, concern, and/or sympathy	--
Esteem	Reassurance of worth, expressions of liking and/or confidence	--
Tangible	Physical or material intervention or aid	Instrumental
Informational	Information or advice-giving	Appraisal
Network	Promotion of social connection and/or reassurance of belonging	Belonging

Yet other researchers have focused on defining social support not by type, but by the processes through which it is experienced by the recipient. For example, Kaplan, Cassell and Gore (1977) framed social support as a construct involving four important processes: (1) *content*, or the meanings that individuals ascribe to the cognitions, emotions and behaviors that characterize the relationship, (2) *directedness*, or the direction of the support from provider to recipient in a reciprocal relationship, (3) *intensity*, or the strength of the support provider's commitment to honor the social support needs of the recipient, and (4) *frequency*, or the number of supportive interactions. Wills and Shinar (2000) describe two prongs of social support: (1)

perceived support, defined as the individual's perception that social support is available to them if need be, and (2) *received support*, defined as support that was recently received. Gottleib and Bergen (2010) subscribe to the former model.

While there is a general consensus that social support is an intrinsically bidirectional construct (Adams et al., 2018; Lehavot et al., 2018; Pearson, 1986; Sarason & Sarason, 2009), there is not agreement on what factors are involved in this relation. For example, Sarason & Sarason (2009) describe a bidirectional relation between *objective* and *subjective* (or perceived) support. Schwarzer & Schulz (2000), define the bidirectionality of the relation as occurring between support *offered* by the provider and support *received* by the recipient.

As evidenced above, definitions of social support vary, and no single approach to the construct's measurement can account for its many related constructs and possible mechanisms. For the purposes of the proposed project, a broad definition of social support described by Ozbay and colleagues (2007) is therefore used: the assistance that an individual receives from other individuals, groups, or larger communities in times of need.

Social Support in Measurement

Given the aforementioned heterogeneity in definitions of social support, methods for measuring the construct over the past 40 years have proven surprisingly narrow in scope. Historically, social support has been measured in one of two ways: (1) self-report measures provided to the support recipient, and (2) qualitative coding of social support behaviors (Cutrona & Suhr, 1992). Research on social support for PTSD has relied

heavily on the former. To date, no studies examining PTSD have used qualitative coding to identify types of supportive behaviors enacted by support providers in vivo.

A large number of commonly used self-report measures of social support ask trauma survivors to identify the amount or availability of social support they received. An example of such a measure is the Medical Outcomes Study Social Support Survey (MOSSS; Sherbourne & Stewart, 1991), which has been used in studies examining recovery from traumatic injury (Price et al., 2014). Similarly, the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) has been employed in multiple studies examining PTSD symptomology (Simon et al., 2019). The MSPSS employs Likert scales to assess the degree to which the examinee felt that a support type was available to them. Unlike most measures of social support, the MSPSS groups items by the support provider's relationship to the trauma survivor (e.g., family, friend, significant other), rather than by the type of social support offered. The 12-item Interpersonal Support Evaluation List (ISEL-12; Cohen et al., 1985) likewise assesses the perceived availability of social support to the examinee, but groups responses by appraisal (i.e., informational), esteem, tangible, and belonging (i.e., network) support. The ISEL-12 has been used in several studies examining the relation between PTSD and social support (Lehavot et al., 2018; McLean et al., 2017; Sripada, Pfeiffer, Rauch, & Bohnert, 2014). In all cases, the measures of support frequency or availability have been found to be reliable and well-validated.

However, when considering the numerous components that collectively represent the construct of social support, these measures have several limitations. First, each of them captures only the degree to which the respondent felt that a given support type or

supportive person was available to them, and for what length of time. They provide little evidence of whether the support was needed, used, or found to be helpful. Indeed, there is a growling literature on a construct called *negative support*, which entails support providers' unhelpful or inappropriate attempts to aid trauma survivors (e.g., treating the survivor differently posttrauma, overinvolvement, accommodation of avoidance symptoms, minimization messaging), with findings suggesting that not all presumably supportive behaviors promote psychological health and wellbeing (Andrews, Brewin, & Rose, 2003; Borja, Callahan, & Long, 2006; Evans, Steel, Watkins, & DiLillo, 2014).

Very few measures of social support have been designed specifically to assess the construct as it relates to trauma. The Crisis Support Scale (CSS; Joseph, Andrews, Williams, & Yule, 1992) is one of the few measures of social support to do so, and has been used to assess perceived social support in the aftermath of a variety of traumatic events, such as terror attacks and sexual assault (Hansen et al., 2018; Wågø, Byrkjedal, Sinnes, Hystad, & Dyregrov, 2017). Like the measures described above, the CSS assesses support availability, though it focuses exclusively on emotional and practical (i.e., tangible) support. However, four of its 14 items assesses possible negative interactions (e.g., "Did people you expected to be supportive make you feel worse at any time just after the disaster?"), and it includes a process variable of support recipient satisfaction (e.g., "Overall, were you satisfied with the support you received just after the disaster?"). It thus addresses a gap in measurement of the social support construct. However, it does not offer information on the types of supportive behaviors a trauma survivor might experience negatively, or the types of supportive behaviors a trauma survivor might find most satisfying.

Social support measures provided to trauma survivors have often excluded potentially relevant support types, and in fact have often focused on emotional support to the exclusion of other support types. In their meta-analysis, Ozer and colleagues drew the conclusion that the emphasis placed on emotional support was likely due to the fact that it was the subtype most readily available to trauma survivors. However, these conclusions were drawn without reference to explicit comparisons between support types. The most prominent self-report measures of social support that have been used in trauma-related projects emphasize emotional support, such as the MSPSS (Zimet et al., 1988). Thus, many studies examining social support do not provide information on other types of support that were likely to have been provided by the social supporters in a trauma survivor's life.

In fact, in cases where other social support types for trauma have been examined, emotional support has not always predominated. The few studies that have explored multiple support types suggest that other forms of support may be sought more frequently and have additional benefit to the social support recipient. For example, Hyman, Gold and Cott (2003) conducted a study with adult females reporting childhood sexual abuse histories, examining the effects of social support by support type using the ISEL-12 (Cohen et al., 1985). The ISEL examines four types of social support, including appraisal (i.e., informational or advice-giving), tangible, esteem, and belonging (i.e., network) support. Regression analyses in their sample revealed that the best model included esteem and appraisal support, and that tangible and belonging support did not meaningfully add to the predictive strength of their models. In their work examining disclosures of sexual assault on Reddit, an online social media platform, Andalibi,

Haimson, De Choudhury and Forte (2016) sought information about which support types trauma survivors were most likely to request. They discovered that the most commonly solicited support type was informational support (requested in 60.8% of examined disclosures), whereas emotional support was sought relatively rarely (requested in 3.7% of posts).

Although the aforementioned study does not offer conclusive evidence as to the preference of all trauma survivors for informational support, it at least suggests that trauma survivors may seek specific types of support from specific contexts or people, and that over-focus on emotional support may miss the broad array of support types being sought or offered. In their project examining the relation of emotional, informational, and tangible support to intimate partner violence and subjective distress in urban African American women, Thompson and colleagues (2000) found that each support type was uniquely related to lower levels of violence and distress. Price and colleagues (2013) found that emotional support was the only support type that was significantly associated with changes in PTSD symptoms and treatment outcomes for veterans in exposure therapy. However, the investigators had collapsed informational and emotional support into a single subtype. Thus, it is unclear if one or both of these support types was driving the observed effects. It is also possible that, as in the study of sexual assault disclosures on Reddit (Andalibi et al., 2016), these findings point to the context specificity and relative appropriateness of certain support types to certain settings or relationships. In this examination of social support in the context of exposure treatment, the authors suggested that emotional support might be a more appropriate form of support for improving treatment response. By contrast, they hypothesized that the provision of

tangible support by a trauma survivor's social network might reduce the efficacy of particular elements of exposure treatment, such as in vivo exposures, that require the patient to enter situations that make them feel distress. Interestingly, the follow-up to this study found that all social support types were associated with positive treatment outcomes (Price et al., 2018). Collectively, these findings suggest that a range of support types are sought out by trauma survivors and the benefit of each type of support may vary across populations and across contexts.

In all of the aforementioned measures, perhaps the greatest limitation is that the construct of social support has been assessed through a reliance on the self-reports of the trauma survivor alone. The conflation of trauma survivor perceptions of social support with the combined construct of provided and received social support is problematic, since social support is an intrinsically dynamic, bidirectional construct involving at least two individuals.

PTSD is associated with significant distress and impairment in the weeks, months, and years after exposure. Several symptoms of PTSD specifically relate to impairment in relational functioning, including avoidance of people, places or situations that remind the affected individual of their traumatic experience(s), strong negative beliefs about oneself, others, and/or the world, excessive self- or other-directed blame, feeling distant or cut off from others, trouble accessing positive feelings (e.g., loving feelings towards others), and irritable behavior or angry outbursts (APA, 2013). Given these symptoms, it is perhaps unsurprising that the negative impact of PTSD on the affected individuals' personal relationships has been well-documented, with risks including caregiver burnout, diminished relationship satisfaction and, in some cases, physical and psychological risks

to prospective support providers (Monson, Taft, & Fredman, 2009). In their examination of the experiences of spouses of ex-Prisoners of War (ex-POWs), Lahav and colleagues (2019) found that ex-POWs' spouses struggled with posttraumatic stress symptoms and reported lower sexual satisfaction in their relationships. Calhoun, Beckham and Bosworth (2002) found that partners of Vietnam War veterans with PTSD reported difficulties with psychological adjustment and caregiver burden when compared to partners of veterans without the diagnosis. A recent review of social factors in trauma recovery identified the self-report biases of trauma survivors as among several limitations of prevailing social support psychometrics, along with the conflation of quantity with quality social support, and the conflation of negative social support with an absence of support (Wagner, Monson, & Hart, 2016). The same review called for future work that treats the social support construct as a social *interaction*, rather than as a social *reaction*.

The Theoretical Argument for Collateral Perspectives

Social support requires at least two participants: a support provider and a support recipient. It is thus intrinsically tied to the theory of social reciprocity, wherein the cognitions and behaviors of one participant in a social relationship are expected to influence those of the other, and vice-versa (Horowitz & Shindelman, 1983). This model posits that in any social relationship, prosocial behavior enacted by one individual is likely to be reciprocated, whereas hostile behavior in one individual is likely to generate a hostile response (Fehr & Gächter, 2000). Reciprocity theory, which originated in social psychology, is a basis for understanding how communities cooperate and avoid collapse (Nowak & Sigmund, 2000). This theory can be conceptualized colloquially as the idea that everything comes with a price, even in relationships. Yet reciprocity theory is

flexible enough to accommodate the idea that the "price" of a given prosocial behavior may vary immensely between participants and contexts in this social marketplace. For example, though reciprocity exists in both, that which is expected in a relationship between a health practitioner and his or her patient (e.g., monetary payment for services rendered) is likely to differ from that expected between partners in a romantic relationship (e.g., love and affection proffered as needed by both parties). This concept has powerful clinical implications, and has in fact been used as an organizing framework for understanding the phenomenon of caregiver burnout (Schaufeli, van Dierendonck, & van Gorp, 1996).

Burnout is defined as a prolonged response to chronic emotional and interpersonal stressors, and has been examined in multiple settings spanning both the professional and the personal (Almberg, Grafström, & Winblad, 1997; Maslach & Leiter, 2016). In the context of personal relationships, burnout has been examined in cases where one member in the relational dyad has taken on a caregiving role (e.g., caring for an elderly relative; Hirakawa, Kuzuya, Enoki, Hasegawa, & Iguch, 2008). In their 1996 paper, Schaufeli, van Dierendonck and van Gorp tested a model for professional burnout amongst student nurses that examined reciprocity (or social exchange) between both the nurses as care providers and their patients and between the nurses as employees and the organization(s) they worked for. This model, which hypothesized that inadequate reciprocity at either level would be associated with greater burnout, was supported. An examination of burnout in direct care staff used a measure of reciprocity that generated an investment-outcome ratio score, in which a ratio score of more than one indicated a relationship in which more was invested than received, while a ratio score less than one indicated a

relationship in which more was received than invested (Rose, Madurai, Thomas, Duffy, & Oyebode, 2010). Researchers on this project found that scores of more than one on the reciprocity measure were associated with emotional exhaustion and increased depersonalization. These outcomes were, in turn, conceptualized as features of caregiver burnout.

The reciprocity model also provides a helpful framework for understanding mechanisms that may affect social support. The presence of persistent PTSD symptoms that directly impact social relationships may increase posttrauma caregiver burden, ultimately compromising social support. Conversely, skillfully delivered social support provided early and consistently may reduce overall burden by preventing PTSD symptoms from developing. Although the literature on caregiving for trauma survivors is small, research on caregiving for other medical presentations (e.g., cancer, dementia) indicates a positive association between caregiver mastery (i.e., self-efficacy in a caregiving role), the quality of social support, and caregiver wellbeing (Boele et al., 2017; Cameron et al., 2014).

Another theoretical model that is likely to be implicated in the bidirectional effects of PTSD and social support is expectancy theory. This theory, which originated with marketing research, posits that an individual is driven to behave in a given way based on their expectation that doing so will result in a specific outcome (Oliver, 1974). The construct was rapidly adopted by other social researchers to better understand patterns of behavior in interpersonal relationships (Rosenthal & Rubin, 1978). Expectancy theory thus encompasses the idea that an individual's expectation of a specific set of behaviors enacted by another person dictates how the former will behave.

In a study examining brief, text-based messages generated by Concerned Significant Others (CSOs; e.g., close friends, family and romantic partners) to motivate a loved one to achieve a behavioral goal, CSO perceptions of their loved ones' motivation to change and their expectation of a positive or negative affective reaction to the message dictated the tone of the messages they wrote (van Stolk-Cooke, Hayes, Baumel, & Muench, 2015). Specifically, CSOs were more likely to generate pessimistic, dismissive or critical messages when they perceived their loved one's motivation to change to be low, and/or when they expected their loved one to react to the message with annoyance or anger. The reverse was also true – when CSOs generated encouraging, affirming or positive messages, this was associated with perceptions that their loved ones' motivation to change was high, and with perceptions that their loved ones would respond to them with gratitude. Recent work in the domain of interpersonal expectancies has found that baseline relationship variables, such as commitment and intimacy, impact behavioral choices that individuals make when the other relational dyad member violates their expectations (Wong, 2018). Considering this model in the context of trauma, it is likely that trauma survivors' behaviors have an impact on the social support that others provide to them, and vice-versa. For example, if a support provider learns to expect an angry or aggressive reaction to their attempts to help a loved trauma survivor, this may have a punishing effect on support providers and cause them to withdraw help. By contrast, if a trauma survivor learns to expect appropriate, consistent social support from a loved one, this may result in a faster recovery trajectory.

The reciprocity and expectancy models together highlight a potentially crucial gap in social support psychometrics: there is no empirically supported measure of the

construct from the perspective of the support provider. Addressing this gap would allow researchers to engage in dyadic explorations of the social support construct, thereby capturing how interpersonal processes may influence it over time.

Where are the Support Providers?

The literature reviewed thus far highlights the fact that posttrauma social support has not been examined from the perspective of social support providers. However, this is not the case in other domains of mental and physical health and wellbeing. In particular, social support has been examined from the provider perspective in relation to substance use disorders and medically ill populations. In both domains, the focus has been on assessing the experiences and behaviors of the close family, friends, and romantic partners surrounding the affected individuals. In the realm of substance use and addiction research, these individuals are typically referred to as Concerned Significant Others (CSOs; Hodgins, Shead, & Makarchuk, 2007; Hussaarts, Roozen, Meyers, van de Wetering, & McCrady, 2012; Meyers, Miller, Smith, & Tonigan, 2002). In more medically-oriented research, such as dementia or HIV-impacted groups, they are called Informal or Family Caregivers (Clyburn, Stones, Hadjistavropoulos, & Tuokko, 2000; Pirraglia et al., 2005; van Pelt et al., 2007).

While social support is treated as a critical tool in prevention efforts for psychopathology in the aftermath of trauma, virtually no work has been done to elucidate what makes a support provider effective, or to help would-be support providers utilize this valuable interpersonal resource efficiently and sustainably. Again, evidence pointing to how this might be done is drawn from elsewhere. In the domain of dementia, Clyburn, Stones, Hadjistabropoulos and Tuokko (2000) examined variables that might predict

caregiver burden in the primary caregivers (professional or familiar) of Alzheimer's patients, finding that caregiver burden was lower in those who felt they were able to effectively manage disturbing behaviors, and had access to formal services themselves. These studies have led to recommendations for how to aid family caregivers in their roles as support providers (Reinhard, Given, Petlick, & Bemis, 2008). Research on CSOs of substance users has arguably made the most progress in investigating support provider experiences, and has produced an evidence-based treatment for CSOs to help them promote treatment-seeking in their substance using friend or family member (Meyers, Miller, Hill, & Tonigan, 1998). Community Reinforcement and Family Training (CRAFT) is a structured therapeutic intervention for CSOs with goals of enhancing CSO safety and stability while promoting treatment-seeking behaviors in the target significant other, and has been shown to be effective when disseminated in community treatment centers (Gianini, Lundy, & Smith, 2009) as well as in self-directed contexts (Manuel et al., 2012).

These findings highlight both the risks of ignoring the support provider experience, as well as the clinical potential of treating support providers as stakeholders in trauma survivor recovery. Specifically, CSOs can experience burnout when they do not have adequate internal and environmental resources, and when faced with symptomology in their loved one that is interpersonally punishing. By contrast, treatments that directly target social support providers hold promise to improve outcomes for individuals struggling with medical illness or psychopathology. If, as in these related health domains, the efforts of supportive others are to be effectively harnessed to promote health and wellbeing in trauma survivors, research on social support and PTSD must

move through the looking-glass to examine the construct from the perspective of the friends, family members, and romantic partners who are most likely to be playing this role on a day-to-day basis. A critical barrier limiting this area of study is a lack of tools to measure social support from the perspective of CSOs.

Addressing the Gaps in Social Support Psychometrics

The literature reviewed thus far highlights three crucial gaps in existing social support measurement in trauma exposed samples. First, most measures of social support do not include a broad range of social support types. Second, most measures of social support capture only one process variable (e.g., support availability) at the exclusion of other relevant variables (e.g., amount of support actually received). Third, most measures of social support do not examine the construct from the perspective of the support provider. At present, no measure of social support exists that captures all of these components of the construct.

In addition, prevailing approaches to the measurement of support provision enacted by CSOs have several limitations that make them difficult to employ in studies of trauma. While qualitative coding schemas used to quantify supportive interactions within a dyad can provide rich, objective data, they are costly and time-consuming. This makes these methods especially difficult to implement in the context of trauma, since trauma survivors and their families are often required to manage numerous responsibilities in the aftermath of an index event (Price et al., 2014; Zatzick et al., 2007). As such, investigations of social support within these samples would benefit from a low-cost, low-burden measure of support provision from the provider perspective.

Likewise, tools that have been developed within other domains to assess related constructs (e.g., caregiving for an elderly family member), may not be adequate to capture the facets of social support that are of interest within the context of trauma recovery. For example, the Caregiving Appraisal Scale (Lawton, Moss, Hoffman, & Perkinson, 2000) assesses multiple experiential components of being a caregiver, such as perceptions of satisfaction, mastery, and burden. However, it does not provide information about caregivers' behaviors. Given the absence of consensus on what social support provision to a trauma survivor entails, a measure capturing a range of content and process variables that can then be reduced and refined is needed to set the stage for more work in this area.

Proposed Study

The proposed study is the first step in a program of research designed to enhance our understanding of how social support is provided by the CSOs of trauma survivors. Specifically, this project entailed the development and preliminary validation of the Supportive Other Experiences Questionnaire (SOEQ) – a social support measure designed to assess social support behaviors from the perspective of a CSO, who is likely to be a primary support provider in the days, weeks and months that follow traumatic events.

Germain (2007) delineates three over-arching steps in the development and validation of psychometrics: (1) item generation and domain identification, (2) validation, and (3) pilot testing. In 1995, the American Psychological Association laid out the requisite attributes of sound measures: content validity, criterion validity, construct

validity, and internal consistency. The specific aims of the present project, along with references to the supporting literature for our approach, are delineated below.

Aim 1: Item Development and Selection. The development of candidate items for a psychological measure is expected to pull from relevant theoretical frameworks for understanding the construct of interest and from prior literature (Fredericksen, Fitzsimmons, Gibbons, Dougherty, Loo, Shurbaji, 2018; Germain, 2007; Nick, Cole, Cho, Smith, Carter & Zelkowitz, 2018). A pool of candidate items for the SOEQ was thus developed based on existing social support theory and the prior research literature on social support types and social support processes.

Specifically, a list of supportive behaviors categorized by type was generated from the Social Provision Scale, an existing qualitative coding schema designed to assess the occurrence of supportive behaviors enacted by individuals towards a help-seeking significant other in real-time (Cutrona & Surh, 1992). The Social Provision Scale was chosen as a source for candidate items for several reasons. First, it delineates observable behaviors that can be identified by a support provider, and does not include items that would require a support provider to make inferences about support recipient attributions or other internal experiences. Second, it includes examples of supportive behaviors designed to represent a broad range of possible support types that have previously been examined empirically and include overlap with support types examined by other researchers (Nick et al. 2018).

Prevailing social support theories have also underscored several potential processes of import to social support delivery (Gottlieb & Bergen, 2010; Kaplan, Cassell & Gore, 1977; Sarason & Sarason, 2009; Schwarzer & Schulz, 2000; Wills & Shinar,

2000). As such, SOEQ candidate items were designed to assess three potential processes of import: (1) CSO perceptions of the frequency with which they enacted a given behavior, (2) CSO perceptions of the effectiveness of a given behavior in promoting their partners' recovery from trauma, and (3) CSO perceptions of difficulty enacting a given supportive behavior. These candidate processes were derived from the literature on definitions of social support described above, as well as from the literature on caregiver burden in the context of PTSD symptomology (Monson, Taft, & Fredman, 2009).

Prior work has found that in the item development stage, measures typically lack strong, clear linkages with the theoretical domains they are intended to capture (Hinkin, 1995). Consonant with other psychometric development work, the present study employed correlation and confirmatory factor analyses to inform item selection (Groth-Marnat & Wright, 2016; Nick et al., 2018).

Hypothesis 1. We hypothesized that confirmatory factor analyses (CFAs) would demonstrate support for our theoretically derived latent constructs, including five social support type factors and three social support process factors. In the event that this hypothesis was not supported, results of iterative CFAs (i.e., fit statistics, nonsignificant or theoretically dissonant factor loadings, covariances between items or factors ≥ 0.8) would be used to inform which items, and which factors, were excluded from the SOEQ.

Aim 2: Convergent and discriminant validity. Convergent and discriminant validity are established via correlation analyses between the candidate measure and previously validated measures capturing other constructs of interest (Groth-Marnat & Wright, 2016).

Hypothesis 2a. Convergent validity will accrue to the SOEQ vis-á-vis significant, correlations in the expected directions between CSO perceptions of social support provision frequency, helpfulness, and difficulty across social support types and valid, reliable measures of relationship satisfaction, caregiver mastery, caregiver burden, caregiver satisfaction, caregiver guilt, empathic concern, personal distress, perspective-taking, trauma survivor PTSD symptoms, CSO vicarious traumatization, and CSO depression (Table 2). Correlations exceeding $r = .80$ will be considered indicators of psychometric redundancy.

Hypothesis 2b. Evidence for discriminant validity of the SOEQ will stem from nonsignificant correlations between CSO perceptions of social support provision frequency, helpfulness and difficulty across social support types and empathic fantasizing as represented in the Interpersonal Reactivity Index (IRI, Davis, 1983; Table 2). Empathic fantasizing was chosen due to the fact that it represents a theoretically distinct variable to social support, and thus should not overlap meaningfully with the SOEQ.

Table 2.
Hypothesized Direction of Correlations between SOEQ Process Scores and Measures of Interest

	SOEQ Frequency	**SOEQ Effectiveness**	**SOEQ Difficulty**
Relationship Satisfaction (RAS)	Positive	Positive	Negative
Caregiver Mastery (C-M)	Positive	Positive	Negative
Caregiver Burden (C-B)	Negative	Negative	Positive
Caregiver Satisfaction (C-S)	Positive	Positive	Negative
Caregiver Guilt (C-G)	Negative	Negative	Positive
Empathic Concern (I-C)	Positive	Positive	Negative
Fantasy (I-F)	N.S.	N.S.	N.S.
Personal Distress (I-PD)	Negative	Negative	Positive
Perspective Taking (I-PT)	Positive	Positive	Negative
Trauma Survivor PTSD (T-PCL)	Negative	Negative	Positive
CSO Vicarious Traumatization (C-PCL)	Negative	Negative	Positive
CSO Depression (C-PHQ)	Negative	Negative	Positive

Note. N.S. = $p \geq .05$, Positive = positive correlation ($p < .05$), Negative = negative correlation ($p < .05$)
Note. RAS = Relationship Appraisal Scale, C-M = Caregiving Appraisal Scale (CAS) – Mastery, C-B = CAS– Burden, C-S = CAS– Satisfaction, C-G = CAS– Guilt, C-I = CAS– Impact, I-E = Interpersonal Reactivity Index (IRI) – Empathic Concern, I-F = IRI– Fantasy, I-PD = IRI– Personal Distress, I-PT = IRI– Perspective-Taking, T-PCL = Trauma Survivor PTSD Checklist for DSM 5, C-PCL = CSO PTSD Checklist for DSM-5, C-PHQ = CSO Patient Health Questionnaire for DSM-5.

Aim 3: Construct validity. Construct validity accrues to a measure when it behaves in theoretically anticipated ways in relation to other variables of interest (Groth-Marnat & Wright, 2016; Nick et al., 2018). We sought evidence of this via two theoretically-informed hypotheses:

Hypothesis 3a. CSOs reporting more difficulty enacting supportive behaviors regardless of support type will also report less improvement in their romantic partner's functioning from the acute posttrauma period to the present, even when accounting for support provision frequency and other relevant covariates.

Hypothesis 3b. Consonant with reciprocity and expectancy theory, lower reported relationship functioning prior to the index trauma is hypothesized to be related to lower reported support provision across support types when accounting for trauma history, vicarious traumatization and depressive symptoms of CSOs.

METHODS

Participants

The final sample for this project included 513 adults, ages 21-40, who were in a romantic relationship with an individual who was exposed to a Criterion A traumatic injury according to the definition of a traumatic event in the DSM-5 within the last year. Sample demographics are presented in Table 3. Events that meet Criterion A in the DSM-5 are described in the Life Events Checklist-5 (LEC-5; Weathers, Blake, et al., 2013). For the purposes of the present study, events that result in traumatic injury were chosen because these events are common, because these injuries tend to stem from a specific, discrete event, are often characterized by an observable trajectory for physical recovery

(e.g. wounds healing), and are less stigmatized than other types of trauma (e.g. sexual assault).

Table 3.
Sample Demographics

Variable	N	%
Male	328	63.9
Ethnicity		
Latino	104	20.3
Non-Latino	391	76.2
Other	13	2.5
Race		
White	318	61.9
Black	116	22.6
Asian	36	7.0
Bi-racial	22	4.3
Would rather not say	10	1.9
Other	10	1.9
Sexual Orientation		
Heterosexual	399	77.8
Gay or lesbian	16	3.1
Other	91	17.7
Relationship Status		
Single	52	10.1
In a relationship, living separately	113	22.0
In a relationship, co-habitating	157	30.6
Married	185	36.1
Divorced/Separated	5	1.0
Education		
Some high school	5	1.0
High school diploma	55	10.7
1-2 years of college	106	20.7
3+ years of college	44	8.6
College degree	229	44.6
Some graduate school	19	3.7
Completed graduate school	48	9.4
Income		
< $20,000	6	1.2
$20,001 - $30,000	13	2.5
$30,001 - $40,000	25	4.9
$40,001 - $50,000	33	6.4
> $50,000	436	85.0
Lifetime exposure to trauma	298	58.1
History of mental health treatment	212	41.3
	M	**SD**
Age	29.72	4.55

Although there are several close relationships through which an individual would likely receive post-trauma support, romantic partners were the focus of the present study. These relationships are likely to involve the provision of a wide range of supportive

behaviors, while other close significant relationships are intrinsically more likely to load on specific support types (e.g. a parent who provides tangible support to their underage child). The rationale for choosing a younger adult sample was twofold: (1) this group tends to have more variability in relationship demographics (e.g. newly involved, unmarried cohabiting, and married dyads, among others), and (2) post-trauma mental health symptoms are negatively associated with age, such that younger adults are at the greatest risk for posttraumatic psychopathology among adults in general.

Exclusion criteria included having an IP address outside the U.S., having an MTurk-connected bank account outside the U.S., being a non-English speaker, and direct involvement by the CSO in the traumatic event experienced by their TS (e.g., a car crash that involved both individuals). Exclusion of non-U.S.-based IP addresses and bank accounts increases the likelihood of obtaining a U.S. sample. Exclusion of non-English speakers was designed to ensure comprehension of the survey content, while exclusion of CSOs who were directly involved in their TS's traumatic event was designed to target CSOs who were more likely to be filling a support role for their TS.

Procedure

Participants were recruited online via Amazon's Mechanical Turk (MTurk). MTurk is a crowdsourcing platform that allows individuals called *requesters* to publish *human intelligence tasks* (HITs) and pay individuals called *workers* to complete them. A growing literature suggests that MTurk is a valid and efficient way to conduct behavioral research, including on trauma-exposed populations, when appropriate validity checks were included in the design (Mason & Suri, 2012; van Stolk-Cooke et al., 2018). To our knowledge, this study and its parent project were the first investigations to use MTurk to

recruit the social support providers of traumatically injured loved ones. As in prior work indicating that the prevalence of traumatic exposure and posttrauma psychopathology in a large MTurk sample is comparable to prevalence rates from more traditional recruitment platforms (e.g. over the phone, face to face), we did not experience significant challenges accessing CSOs of TSs on MTurk (van Stolk-Cooke et al., 2018).

HITs were posted to MTurk seeking participants to complete a questionnaire assessing the impact of a romantic partner's traumatic exposure on their lives. Participants with a U.S.-based IP address and a 75% approval rating from other requesters for work done on prior HITs were able to view our HIT, titled *Answer this survey if a romantic partner was injured in the last year* and were given three hours to complete all included measures. HITs included a hyperlink to the survey, which was hosted by the University of Vermont's *Qualtrics* platform. Individuals who electronically consented to participate were directed to a brief screening page. On this page, participants were asked three yes-no questions as follows: (1) "In the past year, were you in a romantic relationship with someone?" (2) "In the past year, was your partner involved in a life-threatening accident or disaster that resulted in physical injury?" (3) "IF YES, did you directly experience or witness the event that happened to your partner (for example, if your partner was in a car accident, if you were physically present for the accident and/or saw it happen, check YES)?" Only those who responded "Yes" to the first two questions and "No" to the third were able to continue to the study survey.

As in previous anonymized MTurk research, validity checks were included to ensure that only appropriately completed surveys were compensated and included in the final sample. Once a survey had been opened on a given IP address, participants were

barred from reopening and retaking it. Individuals who took fewer than 8 minutes to complete the survey according to MTurk were not compensated or included in final analyses. Participants were compensated $2.00 if their work was approved as per the aforementioned criteria.

Assessments

Details of Trauma: The nature of the traumatic event experienced by the TS was assessed using the Life Events Checklist-5 (LEC-5; Weathers, Blake, et al., 2013). The LEC-5 is a 17 item self-report measure that assesses traumatic exposure. CSOs were asked to identify which of 16 known Criterion A traumatic events was the source of their TS's traumatic exposure. Participants then indicated if their TS experienced the event personally, witnessed it, learned about it, or experienced it as a part of their job.

CSO Trauma History: The CSO's lifetime exposure to traumatic events was also assessed using the LEC-5. CSOs were asked to identify which of 16 known Criterion A traumatic events they had directly experienced or witnessed over the course of their life.

Relationship Satisfaction: The quality of the CSO-TS relationship at the time the traumatic event occurred was assessed using the Relationship Assessment Scale (RAS; Hendrick, 1988). The RAS is a 7-item scale that is designed to measure general relationship satisfaction on a 1 to 5 Likert scale. Scores range from 7-35, with higher scores indicating greater relationship satisfaction.

CSO Caregiver Burden, Satisfaction, Mastery, Demand & Impact: For the 3-month period during which TSs' post-trauma needs were most pressing, CSOs' caregiving experiences were assessed using the Caregiving Appraisal Scale (Lawton, Moss, Hoffman, & Perkinson, 2000). The Caregiving Appraisal Scale is a 27-item self-

report measure that assesses burden, satisfaction, mastery, demand and impact. Ratings are made on a 1-5 point Likert scale. Caregiver Burden scores range from 9-45, with higher scores reflecting greater burden. Caregiver Satisfaction and Caregiver Mastery scores each range from 6-30, with higher scores reflecting greater satisfaction and mastery, respectively. Caregiver Demand and Impact scores each range from 3-15, with higher scores reflecting higher demand and impact, respectively.

Dispositional Empathy: CSO dispositional empathy was assessed using the Interpersonal Reactivity Index (IRI; Davis, 1983). The IRI is a 28-item scale that assesses four domains of cognitive and affective empathy: perspective taking, fantasy, empathic concern and personal distress. Scores for each subscale range from 0-28, with higher scores indicating greater empathy within each domain.

TS PTSD Symptoms: For the 3-month period during which TSs' post-trauma needs were most pressing, CSO impressions of TSs' post-trauma psychopathology was assessed using the PTSD Checlist-5 (PCL-5; Weathers, Litz, et al., 2013). The PCL-5 is a 20-item self-report measure that assesses PTSD symptoms according to the DSM-5 criteria experienced in the last month. Items assess symptoms across 4 symptom clusters of PTSD (re-experiencing, dysphoria, avoidance, and hyperarousal) on a 0 to 4 Likert scale. Scores range from 0-80. While this assessment was not used to assess diagnostic status, higher scores indicated perceived posttraumatic distress of the TS.

CSO Vicarious Traumatization: For the 3-month period during which TSs' post-trauma needs were most pressing, vicarious traumatization of the CSO was assessed using the PCL-5.

TS Recovery: TS recovery from the traumatic event of interest was assessed using the Sheehan Disability Scale (Sheehan, 1983). The Sheehan Disability Scale is a 3-item measure designed to identify the extent to which an individual is currently experiencing impairments in their work, social, and family functioning as a result of psychological distress. CSOs were asked to identify, to the best of their knowledge, the degree to which the TS was experiencing impairment in these three domains for two time points: (1) for the 3-month period during which posttrauma needs were most pressing, and (2) at the time the CSOs were completing the study survey.

CSO Depression: For the 3-month period during which TSs' posttrauma needs were most pressing, depressive symptoms in CSOs were assessed using the Patient Health Questionnaire-8 (PHQ-8; Kroenke, Spitzer, & Williams, 2001). The PHQ-8 is an 8-item self-report measure that assesses depression symptoms. Ratings are made on a 0-3 point Likert scale, pertaining to the frequency with which a symptom was experienced over the time period assessed. Scores range from 0-24, with higher scores indicating more severe depression. The PHQ-8 is adapted from the PHQ-9 and is identical except for the removal of an item on suicidal ideation.

Supportive Other Experiences Questionnaire Candidate Item Development

In order to generate a scale representing a broad range of social support types and support provision processes, candidate items were adapted from the Social Provision Scale (Cutrona & Suhr, 1992) – a qualitative coding schema of social support behaviors. As such, each behavior identified in the coding schema as exemplifying a given support type was rephrased as a first-person action statement (for examples, see Table 4). This

process resulted in a pool of 25 candidate behavioral statements designed to represent informational, network, esteem, tangible, and emotional support.

For each candidate behavioral statement, three sub-prompts were generated to assess various processes by which CSOs might experience their roles as support providers. Underneath each action statement, the following process prompts were included: (1) "How often did you do this?" to assess behavior frequency; (2) "How effective was it?" to assess impact of the behavior on the recipient's recovery; (3) "How hard was it to do this?" to assess difficulty to the CSO of engaging in the behavior. Each of these process variables used a nine-point Likert scale, ranging from 1-9 (see **Appendix A** for original items and Likert anchors). Higher scores reflected greater frequency, effectiveness, and difficulty, respectively.

Table 4.
Examples of Social Provision Scale and Parallel SOEQ Items

Support Type	Social Provision Scale Item	Item rephrased for SOEQ
Informational	"Offers ideas and suggests actions"	"I offered my partner ideas, gave advice, or suggested action steps."
Tangible	"Offers to take over one or more of the recipient's other responsibilities while the recipient is under stress"	"I took over one or more of my partner's other responsibilities while they were recovering (e.g., chores)."
Esteem	"Says positive things about the recipient or emphasizes the recipient's abilities"	"I highlighted positive things about my partner, like his or her strengths, abilities, and successes."
Network	"Offers to provide the recipient with access to new companions"	"I offered/provided my partner with access to new companions."
Emotional	"Offers physical contact, including hugs, kisses, hand-holding, shoulder patting"	"I gave my partner physical affection (e.g., hugs, hand-holding, kisses)."

The instructions for the original item pool read as follows: "The following items are about types of support that people sometimes provide to their partners after stressful events. For each, please rate (a) how **frequently** you provided the support type to your partner, (b) how **effective** it was, and (c) how **hard** it felt to provide it. There are no

right/wrong answers to these items." Instructions were followed by Informational, Tangible, Esteem, Network, and Emotional items, consecutively.

Analyses

Analyses were conducted in *R* (Muthén & Muthén, 2019).

Aim 1. Item selection was achieved through confirmatory factor analysis (CFA). Models were estimated using a polychoric covariance matrix, robust weighted least squares estimation with a mean-and-variance adjusted chi-square (WLSMV) and probit regression coefficients (Li, 2016). Model fit was evaluated using the guidelines of Hu and Bentler (1999). Excellent fit was defined as having a Comparative Fit Index (CFI) and Tucker Lewis Index (TLI) ≥ 0.95, and a root mean square error of approximation (RMSA) value ≤ 0.06. Adequate fit was defined as having a CFI and TLI ≥ 0.90, and a RMSEA value ≤ 0.10.

Both unifactor models examining the fit of items across content factors (i.e., support types), and bifactor models examining the fit of items across content (i.e., support types) and process factors (i.e., provision frequency, helpfulness, and difficulty), were examined.

Aim 2. Correlation analyses were conducted between all candidate SOEQ items to identify areas of psychometric redundancy or weak relations between items loading on a theorized factor. Items with a Pearson correlation coefficient $\geq \pm 0.8$ with another item in its subdomain, or items with a Pearson correlation coefficient $\leq \pm 0.1$ were to be considered candidates for deletion. All correlations between candidate items were within these bounds, so no candidate items were deleted based on these analyses. Convergent and discriminant validity were assessed by correlating SOEQ subscores with scores

derived from other assessed constructs. The internal consistency of the SOEQ was assessed through an examination of Chronbach's Alpha (α) values for each subscale.

Aim 3. The hypothesis that frequency of support provision, regardless of support type, would be positively correlated with CSO perceptions of TSs' physical and mental recovery was evaluated using a multiple regression in which TS functional impairment (SDS score) at the time CSOs completed the survey was the outcome. The indicator variables included TS SDS score at the most pressing posttrauma period, CSO socioeconomic status (SES), relationship satisfaction, and SOEQ Frequency scores.

The hypothesis that low relationship functioning would be negatively associated with support provision frequency across support types was evaluated using a multiple regression in which SOEQ Total Frequency, Informational Frequency, Tangible Frequency and Emotional Frequency served as outcome variables. The indicator variable was relationship functioning. A regression evaluated the association between relationship functioning and the amount of support provided. Separate regressions were run for each SOEQ Frequency subscore. CSO SES, lifetime exposure to trauma, vicarious traumatization, and depression were included as covariates.

RESULTS

Confirmatory Factor Analyses

Two confirmatory factor analyses (CFAs) were conducted to assess model fit of the combined five-unifactor model of social support types suggested by Cutrona & Suhr (1992), and the combined three-unifactor model of the experiential processes that the SOEQ was designed to capture. Prior to conducting these CFAs, correlations between all of the unique items in the SOEQ were examined to identify items with a Pearson

correlation of $r \geq .8$ or an unexpected negative correlation coefficient. There were no relations that met these criteria and all items where included in the initial CFAs. The original unifactor models both demonstrated poor fit (Table 5).

Table 5.
Original Unifactor Models of Social Support Experiences by Type and Process

Model	x^2	*df*	CFI/TLI	RMSEA	SRMR	AIC	BIC
Type	18478.417	2910	.40/.39	.109	.221	148689.158	149392.219
Process	12926.529	2922	.62/.61	.087	.126	143113.270	143766.993

Note. df = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; AIC = Akaike's information criterion; BIC = Bayesian information criterion.

Next, a series of CFAs examining one support type at a time, including only items pertaining to the Frequency process variable were conducted. With the exception of a unifactor model of Network support, each of these models fit the data well (Table 6).

Table 6.
Unifactor Models of Frequency of Supportive Behaviors by Type

Frequency Model	x^2	*df*	CFI/TLI	RMSEA	SRMR	AIC	BIC
Informational	347.549	6	.995/.985	.041	.018	8257.877	8291.689
Tangible	565.107	6	.992/.975	.068	.019	8089.190	8122.971
Esteem	899.127	10	.978/.956	.088	.027	9938.665	9980.930
Emotional	1070.110	15	.982/.970	.065	.032	11715.232	11765.927
Network	465.479	6	.797/.391	.303	.120	8987.960	9021.820

Note. df = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; AIC = Akaike's information criterion; BIC = Bayesian information criterion.

A series of CFAs including all social support types, but restricting the models to a single process variable were conducted. Items with a tenuous theoretical fit to a support type were removed (e.g., "I prayed for my partner" from Emotional support) and items that were posited to load better on another support type on theoretical grounds were moved (e.g., "I spent more time with my partner and made an effort to physically be there for him or her" was moved from Network to Tangible support). These steps improved fit for models of behavior Frequency and Effectiveness, and slightly worsened model fit for Difficulty (Table 7).

Table 7.
Original and Revised Unifactor Models of Social Support Types by a Single Process Variable

Model	x^2	*df*	CFI/TLI	RMSEA	SRMR	AIC	BIC
Frequency 1	6126.086	300	.778/.749	.101	.161	47977.159	48227.836
Frequency 2	5317.798	231	.939/.928	.057	.050	41599.669	41834.211
Effect. 1	6014.866	300	.811/.786	.092	.087	48640.089	48890.517
Effect. 2	5339.487	231	.925/.912	.063	.055	42538.046	42772.474
Difficulty 1	9091.734	300	.929/.919	.071	.039	47370.783	47619.819
Difficulty 2	7908.403	231	.928/.916	.077	.047	42205.724	42438.752

Note. df = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; AIC = Akaike's information criterion; BIC = Bayesian information criterion.
1 = model prior to changes, 2 = revised model

Given that the unifactor models of Network support revealed a poor fit to the designated Network support items, each updated model of social support type by a single process variable was examined without this construct. Results suggested models excluding Network support (BIC = 35225.20) had superior fit to those including Network support (BIC = 41834.21), so this support type was removed from all subsequent analyses.

After identifying models of social support types by each isolated process variable with adequate fit, an updated unifactor model of social support processes was examined. This model demonstrated adequate fit to the data ($df = 1596$, $\chi2 = 20242.609$, $p < .001$, CFI = .862, TLI = .855, SRMR = .078, RMSEA = .060, 90% CI [.058, .063]). However, an examination of the covariances between factors revealed a standardized covariance value of .82 between the latent factors of Social Support Frequency and Social Support Effectiveness. Given the magnitude of this correlation, the Effectiveness process variable was removed from all subsequent analyses. A unifactor model of social support processes including only Frequency and Difficulty as latent variables demonstrated adequate fit to the data ($df = 703$, $\chi2 = 12223.738$, $p < .001$, CFI = .869, TLI = .861, SRMR = .075, RMSEA = .069, 90% CI [.066, .073]). An examination of the

modification indices for this model revealed that the model fit would improve if items were grouped by social support type as well as experiential process.

Next, bifactor models of the SOEQ were examined (Tables 8 and 9).

Table 8.
Changes Made to Bifactor Models in Sequential Order

Bifactor Model	Latent Process Variables	Latent Type Variables	Items Moved	Items Dropped
1*	Frequency Difficulty	Informational Tangible Esteem Emotional	15 moved from Network to Emotional 22 moved from Emotional to Informational 23 and 24 moved from Emotional to Esteem	2, 9, 13, 14, 16, 25
2	*no change*	Informational Tangible Esteem/Emotional	Esteem and Emotional items moved to a combined Esteem/Emotional factor 15 moved from Emotional to Tangible	10
3	*no change*	*no change*	*no change*	3, 20, 22
4	*no change*	Informational Tangible Esteem Emotional	11, 23, 24 moved from Emotional/Esteem to Esteem 17, 18, 19, 21 moved from Emotional/Esteem to Emotional	12
5	*no change*	Informational Tangible Emotional	24 moved from Esteem to Informational	11, 15, 23

* Changes to Bifactor 1 reflect adjustments made during examinations of unifactor models.

The first was a bifactor model accounting for the changes made to the unifactor models described above (i.e., the movement of specific items from one support type to another, the removal of certain items, the removal of the Network support latent variable, and the removal of the Effectiveness process latent variable). This model demonstrated a good fit to the data ($df = 703$, $\chi2 = 12223.738$, $p < .001$, CFI = .943, TLI = .934, SRMR = .070, RMSEA = .048, 90% CI [.044, .052]). The pattern of factor loadings of items onto the process variables of Frequency and Difficulty were as hypothesized. However, the pattern of factor loadings and cross-loadings for social support types revealed limitations to theoretical interpretability (e.g., several items loading on Emotional and Esteem support were not significant). Moreover, an examination of latent factor covariances revealed that Emotional and Esteem support shared a covariance of .95.

Table 9.

Bifactor Models of Social Support Types & Processes

Model	x^2	*df*	CFI/TLI	RMSEA	SRMR	AIC	BIC
1	1271.437	612	.943/.934	.048	.070	69484.872	70020.849
2	1203.097	549	.939/.930	.050	.069	66506.388	66993.249
3	876.948	369	.945/.935	.053	.064	55959.017	56360.099
4	617.244	310	.965/.957	.045	.054	52331.031	52732.907
5	413.352	181	.963/.953	.051	.054	42350.531	42652.821

Note. df = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; AIC = Akaike's information criterion; BIC = Bayesian information criterion.

Due do the issue of factor loadings in the first bifactor model, Emotional and Esteem support items were collapsed onto a single factor in the second bifactor model (Bifactor 2). However, the pattern of factor loadings for Bifactor 2 continued to suggest that specific items were not loading significantly onto Informational support and the new Esteem/Emotional support factors.

In the next model (Bifactor 3), three items that were not loading significantly on support type factors were removed. While the pattern of factor loadings for Bifactor 3 revealed improvement from that observed for Bifactor 2, results revealed that Difficulty items in the Emotional/Esteem support factor were not significantly contributing to this latent variable.

A fourth bifactor model (Bifactor 4) redistributed SOEQ items pertaining to promoting TS confidence and self-efficacy onto a new Esteem support factor, leaving all remaining items from the Esteem/Emotional support factor from the prior two models to load on a separate Emotional support factor. This improved model fit (Table 9). However, the Difficulty items loading on Esteem support were not significant, and the covariance between Informational and Esteem support in this model was high (.75).

The final bifactor model (Bifactor 5) moved the item hypothesized to be driving the high covariance between Informational and Esteem support in Bifactor 4 (i.e., "I was

encouraging, providing my partner with praise for his or her hard work and/or successes") onto Informational support, and dropped the remaining Esteem support items. This resulted in a bifactor model that included two process factors (i.e., Frequency, Difficulty), three support type factors (i.e., Informational Support, Tangible Support, Emotional Support), and a total of eleven prompts. Bifactor 5 demonstrated good fit and an interpretable pattern of factor loadings (Tables 9 and 10). What is more, the AIC and BIC values for Bifactor 5 were substantially lower than any previously examined bifactor model (AIC = 42350.53, BIC = 42652.82). As such, the items and factors represented in Bifactor 5 were used for SOEQ scoring and for all measure validity checks (Figure 1).

SOEQ Scoring

Total scores for each experiential process represented in the final version of the SOEQ (i.e., Frequency, Difficulty) were generated by taking the average Likert scale score from items representing each. Higher average scores for each process subscale represent more support provision experiences, while lower sores represent fewer. Subscores for the frequency and difficulty of support provision by social support type were generated by taking the average Likert scale score of items representing each. Higher average scores for each support process by type represent more support provision experiences, while lower scores represent fewer.

Table 10.

Factor Loadings for the First and Final SOEQ Bifactor Models

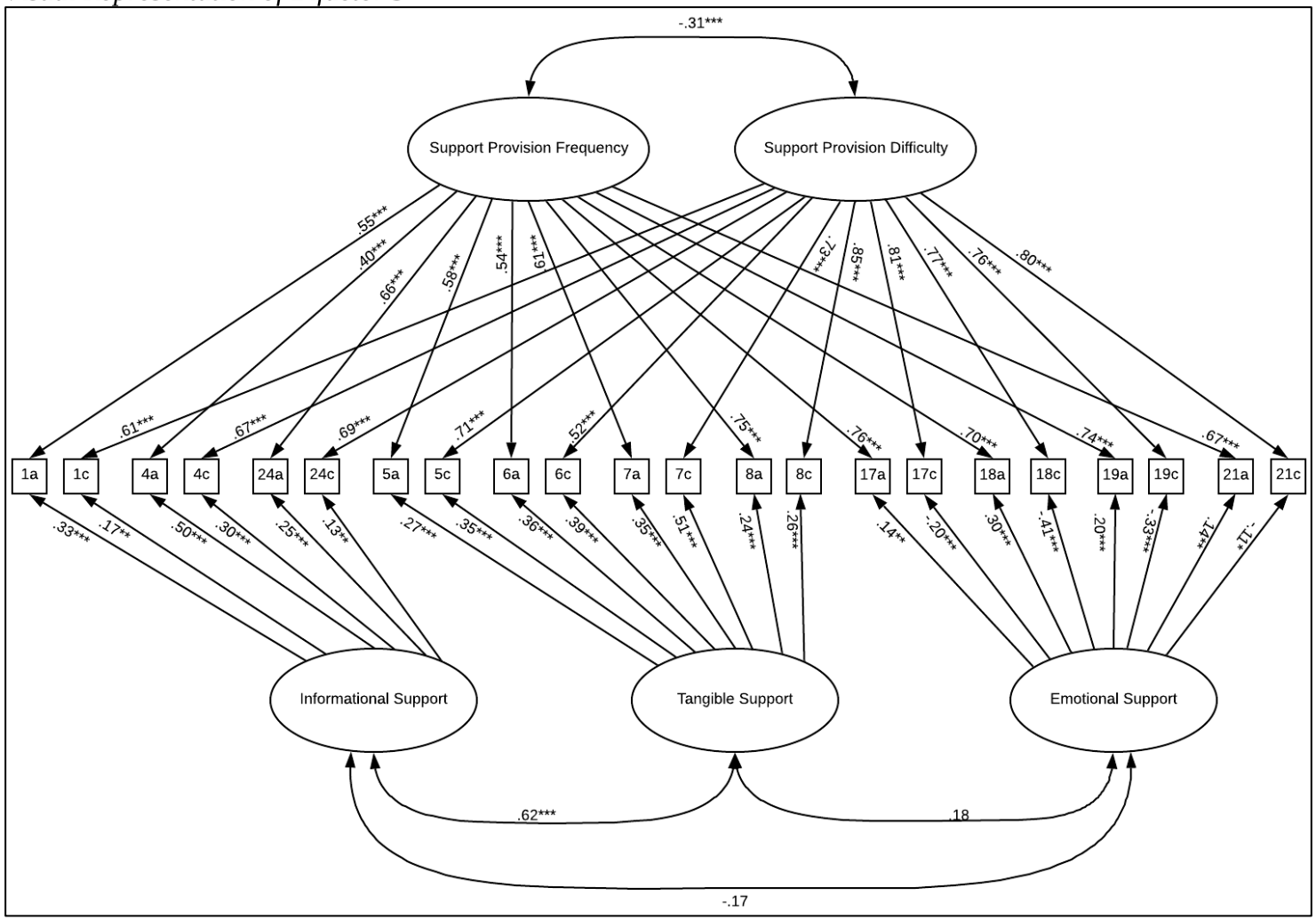
	Bifactor 1						Bifactor 5				
	Info	**Tang**	**Emot**	**Est**	**Freq**	**Diff**	**Info**	**Tang**	**Emot**	**Freq**	**Diff**
Item											
1a	.152*				**.641***		**.325***			**.553***	
1c	**.310***					**.658***	.166*				**.608***
3a	.035				**.557***						
3c	**.627***					**.628***					
4a	.017				**.552***		**.496***			**.395***	
4c	**.300***					**.729***	.259*				**.666***
5a		**.530***			**.536***			.265*		**.663***	
5c		.082				**.734***		**.349***			**.688***
6a		**.414***			**.537***			**.363***		**.582***	
6c		.008				**.745***		**.390***			**.710***
7a		.294*			**.555***			**.345***		**.544***	
7c		**.335***				**.674***		**.509***			**.529***
8a		**.322***			**.585***			.236*		**.608***	
8c		.009				**.779***		.255*			**.731***
10a			.247*		**.692***						
10c			-.172*			**.787***					
11a			**.332***		**.654***						
11c			-.050			**.773***					
12a			-.020		**.560***						
12c			.018			**.752***					
15a				**-.402***	**.646***						
15c				-.032		**.793***					
17a				**-.454***	**.637***				.142*	**.751***	
17c				.298*		**.794***			-.201*		**.847***
18a				**-.565***	**.588***				.291*	**.758***	
18c				**.417***		**.747***			**-.414***		**.812***
19a				**-.422***	**.586***				.202*	**.701***	
19c				**.340***		**.729***			**-.328***		**.772***
20a				-.061	**.476***						
20c				.146*		**.697***					
21a				**-.424***	**.609***				.144*	**.748***	
21c				.171*		**.728***			-.109*		**.755***
22a	.060				**.586***						
22c	-.018					**.731***					
23a			**.395***		**.661***						
23c			.028			**.788***					
24a			.285*		**.680***		.248*			**.678***	
24c			-.075			**.803***	.130*				**.795***

** p < .05*

Note. Loadings > .30 are in boldface.

Figure 1.

Visual Representation of Bifactor 5



** p < .05; ** p < .01; *** p <. 001*

Preliminary Analyses

In preparation for validity checks, all variables were examined to identify outliers or violations of normality. While no outliers were detected, several variables violated assumptions of normality, and were log transformed or square root transformed according to the recommendations of Tabachnick and Fidell (2007). Analyses were conducted with and without transformed variables to determine the effect of transformation on the results. There were no substantive differences in outcomes, and so results with the original data are presented.

A series of correlational analyses and t-tests determined if demographic covariates should be included in construct validity analyses. Results suggested that demographic covariates such as age, SES, education, gender, CSO treatment history, relationship length, and relationship termination were either not significantly or weakly related to variables of interest. There were small, negative correlations between SES and all SOEQ Difficulty subscales. Although no significant differences were found in support provision Frequency by SES, this covariate was included in subsequent analyses due to the role it plays in trauma-related psychopathology (Brattström, Eriksson, Larsson, & Oldner, 2015).

Means, standard deviations, and correlations among all validated measures used to establish convergent and divergent validity included in the present study were examined (Table 11).

The included sample reported high relationship satisfaction on the RAS (M = 27.35, SD = 5.32). RAS scores were significantly correlated with all caregiver appraisals (CAS), empathic concern (IRI-EC), empathic personal distress (IRI-PD), empathic

perspective taking (IRI-PT), TS PTSD symptomology (T-PCL), CSO PTSD symptomology (C-PCL), and CSO depression symptomology (C-PHQ) in the expected directions. RAS scores were not significantly correlated to empathic fantasizing (IRI-FS).

Responses to the CAS suggested that on average, CSOs reported a high level of mastery (*M* = 24.29, *SD* = 4.94) and satisfaction (*M* = 21.44, *SD* = 6.95) in their roles as caregivers. CSOs reported moderate levels of caregiver burden (*M* = 22.22, *SD* = 8.65), and impact (*M* = 9.21, *SD* = 4.60). On average, CSOs reported low levels of caregiver guilt (*M* = 6.95, *SD* = 2.78). Overall, CAS subscales correlated to each other and to other measures of interest in expected directions. With the exception of caregiver satisfaction, CAS subscales were not significantly correlated with empathic fantasizing (IRI-FS).

CSO responses to the subscales of the IRI yielded scores in the average range for each type of dispositional empathy, including empathic concern (*M* = 16.38, *SD* = 3.66), fantasy (*M* = 17.16, *SD* = 3.50), personal distress (*M* = 15.57, *SD* = 4.40) and perspective-taking (*M* = 17.93, *SD* = 3.13). While empathic fantasizing was moderately correlated with the other three dispositional empathy subscales, it did not significantly correlate with most other measures of interest.

Regarding CSO perceptions of their partners' PTSD symptomology, CSOs responses yielded mean PCL scores that exceeded a normative threshold of 30 for the general population (*M* = 32.91, *SD* = 20.54; Blevins et al., 2015). CSO vicarious trauma symptomology yielded mean scores in the normative range (*M* = 26.59, *SD* = 22.76). On average, CSOs reported experiencing mild depressive symptomology (*M* = 8.37, *SD* = 6.59). Scores on these DSM-5 diagnostic scales correlated in the expected directions with other variables of interest.

Table 11.

Correlations, Sample Means and Standard Deviations for Measures Included for SOEQ Validation

	1. RAS	2. C-M	3. C-B	4. C-S	5. C-G	6. C-I	7. I-E	8. I-F	9. I-PD	10. I-PT	11. T-PCL	12. C-PCL	13. C-PHQ
1.	1.00												
2.	.46***	1.00											
3.	-.48***	-.71***	1.00										
4.	.39***	.16***	.02	1.00									
5.	-.56***	-.65***	.77***	-.23***	1.00								
6.	-.46***	-.66***	.88***	.07	.74***	1.00							
7.	.17***	.22***	-.20***	.20***	-.20***	-.22***	1.00						
8.	.06	.04	.00	.21***	-.02	-.01	.33***	1.00					
9.	-.13**	-.28***	.28***	.06	.24***	.29***	-.24***	.32***	1.00				
10.	.16***	.14**	-.08	.24***	.11**	-.09*	.60***	.35***	-.10*	1.00			
11.	-.31***	-.65***	.71***	.17***	.57***	.70***	-.14**	.05	.26***	-.04	1.00		
12.	-.34***	-.67***	.75***	.14**	.64***	.78***	-.21***	.05	.32***	-.09	.83***	1.00	
13.	-.31***	-.65***	.73***	.13**	.57***	.71***	-.16***	.02	.29***	-.06	.77***	.84***	1.00
M	27.35	24.29	22.22	21.44	6.95	9.21	16.38	17.16	15.57	17.93	32.81	26.59	8.37
SD	5.32	4.94	8.65	4.95	2.78	4.60	3.66	3.50	4.40	3.13	20.54	22.76	6.59

Note. 1. RAS = Relationship Appraisal Scale, 2. C-M = Caregiving Appraisal Scale – Mastery, 3. C-B = Caregiving Appraisal Scale – Burden, 4. C-S = Caregiving Appraisal Scale – Satisfaction, 5. C-G = Caregiving Appraisal Scale – Guilt, 6. C-I = Caregiving Appraisal Scale –Impact, 7. I-E = Interpersonal Reactivity Index – Empathic Concern, 8. I-F = Interpersonal Reactivity Index – Fantasy, 9. I-PD = Interpersonal Reactivity Index – Personal Distress, 10. I-PT = Interpersonal Reactivity Index – Perspective-Taking, 11. T-PCL = Trauma Survivor PTSD Checklist for DSM 5, 12. C-PCL = CSO PTSD Checklist for DSM-5, 13. C-PHQ = CSO Patient Health Questionnaire for DSM-5.

* $p < .05$, ** $p < .01$, *** $p < .001$

Validation of the SOEQ and Hypothesis Testing

Reliability Coefficient alphas for the 11-item SOEQ were excellent for both total process scores (α = .90 for Total Frequency, α = .94 for Total Difficulty). Coefficient alphas for support type subscales ranged from adequate to good: Informational Frequency (α = .70), Informational Difficulty (α = .81), Tangible Frequency (α = .79), Tangible Difficulty (α = .87), Emotional Frequency (α = .85), Emotional Difficulty (α = .86).

Convergent & Discriminant Validity All subscales of the SOEQ were correlated to one another in expected directions (Table 12). There was a small, negative correlation between total support Frequency and Difficulty, $r(510) = -.16$, $p < .001$. The frequency and difficulty branches of Informational support were not significantly correlated, nor were the frequency and difficulty branches of Tangible support. There was a medium negative correlation between Emotional support frequency and difficulty, $r(510) = -.35$, $p < .001$.

Table 12.
Correlations, Sample Means and Standard Deviations for SOEQ Subscales

	Freq	**Diff**	**Info-F**	**Info-D**	**Tang-F**	**Tang-D**	**Emot-F**	**Emot-D**
Freq	1.00							
Hard	-.16***	1.00						
Info-F	.83***	.02	1.00					
Info-D	-.13**	.89***	-.00	1.00				
Tang-F	.90***	-.12**	.65***	-.10*	1.00			
Tang-D	-.07	.90***	.07	.73***	-.04	1.00		
Emot-F	.89***	-.28***	.62***	-.21***	.70***	-.18***	1.00	
Emot-D	-.24***	.92***	-.03	.75***	-.20***	.72***	-.35***	1.00
M	7.14	4.28	6.81	4.58	7.07	4.62	7.45	6.25
SD	1.4	2.02	1.56	2.15	1.61	2.14	1.58	2.35

Note. Freq = Total Frequency subscale, Diff = Total Difficulty subscale, Info-F = Informational Frequency subscale, Info-D = Informational Difficulty subscale, Tang-F = Tangible Frequency subscale, Tang-D = Tangible Difficulty subscale, Emot-F = Emotional Frequency subscale, Emot-D = Emotional Difficulty subscale.
* $p < .05$, ** $p < .01$, *** $p < .001$

The SOEQ subscales were correlated with the RAS, all CAS subscales, all IRI subscales, TS PTSD symptomology, CSO vicarious traumatization and CSO depression

symptomology (Table 13). No correlations in a problematically high range (i.e., $r \geq \pm .8$) were detected.

Table 13.
Correlations of SOEQ Subscales to Measures Included for Validation

	Freq	Diff	Info-F	Info-D	Tang-F	Tang-D	Emot-F	Emot-D
RAS	.45***	-.44***	.23***	-.35***	.40***	-.31***	.50***	.51***
C-M	.28***	-.54***	.11*	-.51***	.21***	-.42***	.37***	-.51***
C-B	-.16***	.59***	.03	.49***	-.11*	.49***	-.29***	.59***
C-S	.45***	-.11*	.35***	-.06	.40***	-.06	.44***	-.17***
C-G	-.27***	.53***	-.06	.45***	-.21***	.41***	-.39***	.56***
C-I	-.18***	.58***	.01	.49***	-.13**	.47***	-.32***	.59***
I-E	.31***	-.23***	.23***	-.16***	.26***	-.25***	.31***	.21***
I-F	.17***	-.08	.18***	-.08	.14**	-.07	.14**	.08
I-PD	-.02	.20***	.05	.18***	-.02	.17***	-.06	-.20***
I-PT	.28***	-.14**	.22***	-.11*	.23***	-.15**	.27***	.12**
T-PCL	-.02	.44***	.11*	.43***	-.01	.36***	-.13**	-.42***
C-PCL	-.12**	.52***	.06	.48***	-.08	.45***	-.25***	-.50***
C-PHQ	-.09	.48***	.04	.45***	-.05	.42***	-.19***	-.43***

Note. RAS = Relationship Appraisal Scale, C-M = Caregiving Appraisal Scale (CAS) – Mastery, C-B = CAS – Burden, C-S = CAS – Satisfaction, C-G = CAS – Guilt, C-I = CAS – Impact, I-E = Interpersonal Reactivity Index (IRI) – Empathic Concern, I-F = IRI– Fantasy, I-PD = IRI– Personal Distress, I-PT = IRI– Perspective-Taking, T-PCL = Trauma Survivor PTSD Checklist for DSM 5, C-PCL = CSO PTSD Checklist for DSM-5, C-PHQ = CSO Patient Health Questionnaire for DSM-5, Freq = SOEQ Total Frequency, Diff = SOEQ Total Difficulty, Info-F = SOEQ Informational Frequency, Info-D = SOEQ Informational Difficulty, Tang-F = SOEQ Tangible Frequency, Tang-D = SOEQ Tangible Difficulty, Emot-F = SOEQ Emotional Frequency, Emot-D = SOEQ Emotional Difficulty.
* $p < .05$, ** $p < .01$, *** $p < .001$

In order to establish *discriminant validity*, the SOEQ subscales were correlated with the IRI-FS. Empathic fantasizing was chosen to establish discriminant validity for several reasons. First, the IRI-FS is designed to assess the degree to which respondents transpose themselves into the intra- and interpersonal experiences of characters in books, films, and plays. It is thus designed to capture a concept that is theoretically distinct from CSO experiences as support providers. Second, the IRI-FS correlated either weakly or not significantly with all measures included to establish convergent validity of the SOEQ. There was a small correlation between the SOEQ Frequency subscale and the IRI-FS, $r(510) = .17$, $p < .001$, and a no significant correlation between the SOEQ Difficulty subscale and the IRI-FS, $r(510) = -.08$, $p = .071$. There were small correlations between

the IRI-FS and SOEQ Informational, $r(510)= .18$, $p < .001$, Tangible, $r(510) = .13$, $p = .002$, and Emotional support frequency, $r(510) = .14$, $p = .001$. The correlations between the IRI-FS and SOEQ Informational, $r(510) = -.08$, $p = .066$, Tangible, $r(510) = -.07$, $p = .109$, and Emotional support difficulty, $r(510) = .08$, $p = .087$, were not significant. The subscales of the SOEQ shared less than 3.5% variance with the IRI-FS, consistent with the hypothesis that these tests are capturing theoretically different concepts.

In order to establish *convergent validity*, the SOEQ subscales were correlated with several variables hypothesized to be theoretically associated with CSO social support. First, the SOEQ subscales were correlated to relationship satisfaction (RAS). There was a medium, positive correlation between the RAS and the SOEQ Frequency subscale, $r(509) = .44$, $p < .001$, and a medium, negative correlation between the RAS and the SOEQ difficulty subscale, $r(509) = -.44$, $p < .001$. There was a small positive correlation between the RAS and SOEQ Informational support frequency, $r(509) = .23$, $p < .001$. There was a medium positive correlation between the RAS and SOEQ Tangible support frequency $r(509) = .40$, $p < .001$. There was a large positive correlation between the RAS and SOEQ Emotional support frequency $r(509) = .50$, $p < .001$. There were medium negative correlations between the RAS and both Informational $r(508) = -.35$, $p < .001$, and Tangible support difficulty $r(509) = -.31$, $p < .001$. The negative correlation between the RAS and Emotional support difficulty was large $r(509) = -.51$, $p < .001$.

Next, the SOEQ subscales were correlated with the CAS subscales. While the correlations between caregiver burden (CAS-B) and the difficulty branches of the SOEQ were medium to large, $r(510) = .49$-$.59$, *p's* < .001, they were not large enough to

indicate psychometric redundancy. Though Informational support frequency was not significantly correlated with caregiver burden, guilt, and impact, all remaining branches of the CAS were significantly correlated with the subscales of the SOEQ in the expected directions.

The SOEQ subscales were then correlated with the remaining subscales of the IRI. There were small to moderate correlations between empathic concern (IRI-EC) and all SOEQ subscales in the expected directions. There were small, significant correlations between personal distress (IRI-PD) and all of the SOEQ Difficulty subscales. The correlations between the IRI-PD and all SOEQ Frequency subscales were not significant. There were small to moderate correlations between perspective-taking (IRI-PT) and all SOEQ subscales in the expected directions.

Finally, the SOEQ subscales were correlated with CSO and TS mental health symptomology, including CSO vicarious traumatization (C-PCL), CSO depression (C-PHQ) and TS posttraumatic stress (T-PCL). There was a small negative correlation between the SOEQ Frequency subscale and the C-PCL, $r(510) = -.12$, $p = .007$, and a large positive correlation between the SOEQ Difficulty subscale and the C-PCL, $r(510) = .52$, $p < .001$. Informational and Tangible support frequency were not significantly correlated with C-PCL scores. However, there was a moderate negative correlation between Emotional support frequency and the C-PCL $r(510) = -.25$, $p < .001$. The correlations between vicarious traumatization and Informational, $r(509) = .48$, $p < .001$ Tangible, $r(510) = .45$, $p < .001$, and Emotional support difficulty, $r(510) = .50$, $p < .001$, were medium to large.

The correlation between SOEQ Frequency and the C-PHQ was not significant, $r(510) = -.09$, $p = .053$, while there was a medium correlation between SOEQ Difficulty and the C-PHQ, $r(510) = .48$, $p < .001$. There were no significant correlations between the C-PHQ and both Informational and Tangible support frequency. However, there was a small negative correlation between the C-PHQ and Emotional support frequency, $r(510) = -.29$, $p < .001$. There were medium positive correlations between the C-PHQ and Informational $r(509) = .45$, $p < .001$, Tangible, $r(510) = .42$, $p < .001$, and Emotional support difficulty $r(510) = .43$, $p < .001$.

The correlation between SOEQ Frequency and the T-PCL was not significant, while the correlation between SOEQ Difficulty and the T-PCL was medium, $r(510) = .44$, $p < .001$. There was a small, positive correlation between Informational support frequency and the T-PCL, $r(510) = .11$, $p = .013$, and a small, negative correlation between Emotional support frequency and the T-PCL, $r(510) = -.13$, $p = .002$. The correlation between Tangible support frequency and the T-PCL was not significant. There were medium, positive correlations between the T-PCL and Informational $r(509) = .43$, $p < .001$, Tangible, $r(510) = .36$, $p < .001$, and Emotional support difficulty, $r(510) = .42$, $p < .001$.

Construct Validity In order to evaluate the construct validity of the SOEQ, several hypotheses were tested with the goal of determining whether the subscales related to well-established constructs in anticipated ways. In order to test the hypothesis that the difficulty of support provision would be negatively associated with CSOs' perceptions of their partners' physical and mental recovery, several multiple regressions were conducted (Table 14).

Table 14.

Regressions of Relationship Functioning & SOEQ Subscales as Predictors of TS Recovery (N = 505)

SOEQ Total Process Scores	***b***	***SE***	***t***	ΔR^2	***p***
Step 3				.10	.000
Acute Period SDS* **	0.493	0.05	10.28		.000
CSO SES	-0.190	0.18	-1.04		.300
Relationship satisfaction* **	-0.281	0.07	-3.85		.000
Total Frequency	-0.506	0.26	-1.94		.053
Total Difficulty* **	1.591	0.18	8.85		.000
SOEQ Informational Support Scores	***b***	***SE***	***t***	ΔR^2	***p***
Step 3				.08	.000
Acute Period SDS* **	0.470	0.05	9.79		.000
CSO SES	-0.207	0.19	-1.11		.266
Relationship satisfaction* **	-0.453	0.07	-6.80		.000
Informational Frequency	0.383	0.219	1.75		.080
Informational Difficulty* **	1.267	0.16	7.74		.000
SOEQ Tangible Support Scores	***b***	***SE***	***t***	ΔR^2	***p***
Step 3				.06	.000
Acute Period SDS* **	0.520	0.05	10.54		.000
CSO SES	-0.246	0.19	-1.31		.192
Relationship satisfaction* **	-0.409	0.07	-5.76		.000
Tangible Frequency*	-0.511	0.23	-2.23		.026
Tangible Difficulty* **	1.079	0.17	6.54		.000
SOEQ Emotional Support Scores	***b***	***SE***	***t***	ΔR^2	***p***
Step 3				.12	.000
Acute Period SDS* **	0.521	0.05	11.21		.000
CSO SES	-0.232	0.18	-1.29		.199
Relationship satisfaction*	-0.182	0.07	-2.45		.015
Emotional Frequency**	-0.793	0.24	-3.36		.001
Emotional Difficulty* **	1.360	0.16	8.51		.000

* $p < .05$, ** $p < .01$, *** $p < .001$

With the inclusion of total and support type-specific Frequency and Difficulty SOEQ subscales at step 3, all four models accounted for a significant portion of variance in CSO perceptions of TS recovery: Total, $R^2\Delta = .10$, $F(5, 501) = 67.49$, $p < .001$, Informational, $R^2\Delta = .08$, $F(5, 500) = 61.95$, $p < .001$, Tangible, $R^2\Delta = .06$, $F(5, 501) = 57.12$, $p < .001$, Emotional, $R^2\Delta = .12$, $F(5, 501) = 71.46$, $p < .001$. Perceived difficulty of support provision was significantly related to TS recovery in all models. Specifically, the more difficult CSOs found it to provide social support, the less improvement they

perceived in their TS's functioning from the most pressing posttrauma period to present. By contrast, support provision frequency was significant only in models of Tangible (b = -.51, t[501] = -2.23, p = .026) and Emotional support (b = -.79, t[501] = -8.51, p < .001).

Multiple regressions were then conducted to test the hypothesis that relationship functioning would be positively associated with all SOEQ Frequency subscales (Table 15).

Table 15.

Regressions of Relationship Satisfaction and CSO Mental Health Variables as Predictors of SOEQ Frequency Scores (N = 505)

SOEQ Total Frequency	***b***	***SE***	***t***	ΔR^2	***p***
Step 3				.17	.000
CSO SES	-0.013	0.03	-0.41		.683
CSO Depression	0.017	0.02	1.11		.269
CSO Trauma Exposure	0.120	0.11	0.97		.334
CSO Vicarious Traumatization	-0.002	0.00	-0.39		.698
Relationship Satisfaction* **	0.120	0.01	10.70		.000
SOEQ Informational Frequency	***b***	***SE***	***t***	ΔR^2	***p***
Step 3				.05	.000
CSO SES	0.012	0.04	0.32		.751
CSO Depression	0.002	0.02	0.11		.913
CSO Trauma Exposure	-0.110	0.14	-0.80		.421
CSO Vicarious Traumatization	0.010	0.01	1.91		.057
Relationship Satisfaction* **	0.090	0.01	6.35		.000
SOEQ Tangible Frequency	***b***	***SE***	***t***	ΔR^2	***p***
Step 3				.15	.000
CSO SES	-0.022	0.04	-0.60		.552
CSO Depression	0.026	0.02	1.44		.152
CSO Trauma Exposure	0.137	0.13	1.03		.305
CSO Vicarious Trauma	-0.002	0.01	-0.41		.686
Relationship Satisfaction* **	0.127	0.01	9.60		.000
SOEQ Emotional Frequency	***b***	***SE***	***t***	ΔR^2	***p***
Step 3				.24	.000
CSO SES	-0.023	0.03	-0.65		.517
CSO Depression	0.019	0.02	1.13		.259
CSO Trauma Exposure*	0.247	0.12	2.00		.046
CSO Vicarious Trauma*	-0.011	0.00	-2.12		.034
Relationship Satisfaction* **	0.138	0.01	11.36		.000

* p < .05, ** p < .01, *** p < .001

Among the other variables assessed, CSO lifetime history of trauma exposure (b = .25, t[505] = 2.00, p = .046) and vicarious traumatization (b = .01, t[505] = -2.12, p = .034) were significantly related to the amount of emotional support CSOs provided to their traumatized partners. Thus, relationship satisfaction was significantly related to the amount of social support CSOs provided, regardless of type, such that low satisfaction was associated with less support provision, above and beyond the effects of CSO depressive symptoms, lifetime trauma exposure, vicarious traumatization, and CSO SES.

DISCUSSION

The present study aimed to develop and validate the Supportive Other Experiences Questionnaire (SOEQ), a self-report measure of important facets of social support from the perspective of the support provider. Results of the present study offer preliminary support for the factor structure, internal consistency, convergent validity, discriminant validity, and construct validity of the SOEQ.

A series of Confirmatory Factor Analyses (CFAs) were conducted to identify which SOEQ candidate items and factors demonstrated the best fit to the data. Sequential CFAs revealed several weaknesses in the original hypothesized factor structure of the SOEQ. First, unifactor models examining the SOEQ items by support type revealed that Network Support, which was designed to encompass behaviors that promoted TS companionship and/or access to relevant social communities, did not fit the data well. One potential explanation for the poor fit of Network Support is in the theoretical overlap between several Network Support prompts and other support types. For example, though the item, “I spent more time with my partner and made an effort to physically be there for him or her,” was originally intended to load on Network Support, it seems to also

encompass features of Tangible and Emotional Support. Thus, while the unifactor analyses in the present study in no way negate the existence or potential utility of Network Support, they suggest that this support type may be either less relevant to the CSO-TS context, or too similar to other forms of social support to be uniquely specified.

Second, both unifactor models examining the SOEQ items by support type and the first bifactor model of the SOEQ revealed strong covariance between the latent factors of Emotional and Esteem Support. This was not altogether unexpected, given that the definitions for each of these support types have the greatest theoretical overlap. For example, Cutrona & Suhr's (1992) coding schema describes Esteem Support as including complements (i.e., "Says positive things about the recipient or emphasizes the recipient's abilities"), and Emotional Support as including encouragement (i.e., "Provides the recipient with hope and confidence"). Although an argument can be made that these behavioral examples are distinct, both appear to reference a promotion of self-efficacy within the support recipient. Other recent investigations of social support have collapsed these support types onto a single factor (Nick et al., 2018), presumably for the same reason. Subsequent bifactor analyses examined models that collapsed Emotional and Esteem support onto a single factor, rearranged items within each factor to better align to the original definitions of each support type, or eliminated a factor. The model that fit the data best eliminated the Esteem Support factor, preserving only one Esteem Support item that was then loaded onto the Informational Support factor. This item, "I was encouraging, providing my partner with praise for his or her hard work and/or successes," was moved to Informational Support due to high covariance with items in this category,

and because the language of the item can be interpreted theoretically as a form of personalized feedback (and, therefore, information) for the TS.

Finally, unifactor models of supportive behaviors by process suggested a large covariance between the process variables of Frequency and Effectiveness. Thus, our hypothesis that these process prompts would capture two unique constructs was not supported. The high level of covariance between support provision frequency and perceptions of support provision effectiveness makes sense. It is unlikely, for instance, that CSOs would report providing a great deal of support in a domain that they believed was unlikely to be fruitful to TS recovery. What is more, while there are many barriers to objective measurement of support provision frequency and difficulty in real-time, the effectiveness of a social support intervention can be measured in a more psychometrically sound way through longitudinal analyses of the effects of given behaviors on outcomes of interest (e.g., TS symptom severity or functional impairment). The decision was therefore made to remove the Effectiveness process variable from the SOEQ, while preserving the Frequency variable.

A final bifactor model including three of the original five support types (i.e., informational, tangible, emotional), two of the original three support processes (i.e., frequency, difficulty), and eleven behavioral prompts demonstrated good fit to the data and an interpretable pattern of significant factor loadings, outperforming all other unifactor and bifactor models examined on fit indices.

Notably, while the difficulty branches of items designed to assess Informational and Tangible Support loaded positively on these factors, the Difficulty branches of items designed to assess Emotional support loaded negatively. As such, participants' responses

revealed a pattern by which Informational and Tangible Support factors were represented through greater frequency and greater difficulty enacting each behavior, while the Emotional Support factor was characterized by greater frequency and less difficulty enacting each behavior. Informational Support (e.g., advice-giving, cognitive reappraisal, teaching) and Tangible Support (e.g., financial aid, material resources, needed services) are intrinsically labor-intensive. Though behaviors representing Emotional Support (e.g., demonstrations of care, respect, empathy, affection) are not necessarily time- or resource-consuming, they require a level of intimacy that is not characteristic of the other two support types examined. Frequency and Difficulty of Informational and Tangible Support might therefore be expected to covary in the same direction, such that the more one enacts them, the more one notices the strain of doing so. Meanwhile, Frequency and Difficulty of Emotional Support might be expected to be negatively associated with each other, such that frequency of support provision is contingent upon a level of relational ease not required by the other support types.

Correlation analyses between SOEQ subscales and a variety of relevant measures provided evidence of both convergent and discriminant validity. The Fantasy subscale of the Interpersonal Reactivity Index (IRI-FS) was correlated with all SOEQ subscales in order to establish discriminant validity. The IRI-FS is designed to capture respondents' capacity for imagination through their ability to visualize themselves experiencing the thoughts, feelings and behaviors of fictional characters, and should therefore correlate only weakly, if at all, with a measure designed to capture support provider experiences. As anticipated, empathic fantasizing was not significantly correlated with any of the difficulty branches of the SOEQ, and the positive correlations between empathic

fantasizing and the frequency branches of the SOEQ were small, sharing less than 3.5% total variance.

Providing evidence for convergent validity, SOEQ total and support type-specific Frequency subscales had small to medium positive correlations with relationship satisfaction, caregiver mastery, caregiver satisfaction, empathic concern, and empathic perspective-taking, as anticipated. SOEQ Total Frequency, Tangible Support Frequency, and Emotional Support Frequency were negatively correlated with caregiver burden, caregiver guilt, and caregiver impact, as anticipated. Contrary to hypotheses, neither SOEQ Total Frequency nor Tangible Support Frequency were significantly correlated with TS PTSD or CSO depression, and the negative correlation between SOEQ Total Frequency and CSO vicarious traumatization was small. This suggests that Total and Tangible Support provision Frequency may not be as sensitive to TS or CSO mental health symptomology as other constructs captured by the SOEQ, and perhaps speaks to the more impersonal nature of Tangible support. By contrast, there were small, negative correlations between Emotional Support Frequency and all measures of TS and CSO mental health symptomology as anticipated. These findings resonate with the bifactor structure of the SOEQ, suggesting that the frequency with which CSOs' offer Emotional Support may be more sensitive to the influence of TS or CSO mental health symptoms than other forms of social support.

SOEQ total and support type-specific Difficulty branches were negatively correlated with relationship satisfaction, caregiver mastery, empathic concern, and empathic perspective-taking, and positively correlated with caregiver burden, caregiver guilt, caregiver impact, empathic personal distress, TS PTSD, CSO vicarious

traumatization, and CSO depression as anticipated. Contrary to hypotheses, Informational and Tangible Support Difficulty were not significantly associated with caregiver satisfaction. This suggests that CSOs who were dissatisfied in their relationships were no more likely to report having difficulty providing these support types than CSOs who were satisfied in their relationships prior to the index event. However, there were small, significant negative correlations between caregiver satisfaction and SOEQ Total and Emotional Support Difficulty, as expected.

Of particular interest to us was establishing the degree to which the Difficulty branches of the SOEQ overlapped with the construct of Caregiver Burden as measured by the Caregiving Appraisal Scale. The correlations between SOEQ Difficulty subscales and Caregiver Burden were medium to large, but did not approach a threshold that would suggest redundancy between the two constructs. These correlations suggest that CSOs did not conflate global experiences of burden with difficulty enacting any specific supportive behavior articulated in the SOEQ. Collectively, these findings constitute promising evidence of convergent and discriminant validity for the SOEQ subscales.

Part of establishing construct validity for a new measure is to ascertain whether its subscales relate to other variables of interest in expected ways. We examined the SOEQ's performance in two separate regression analyses. Our first hypothesis was that SOEQ Difficulty subscales would be significantly, negatively associated with CSO perceptions of improvements in TS functional impairment between the most acute posttrauma period and the present, even when accounting for support provision frequency and relevant demographic and relational variables. This hypothesis was supported, such that the more difficult CSOs found it to enact supportive behavior, the less improvement

they perceived in their TSs functioning from the most acute posttrauma period to present. This finding corresponds to a literature suggesting that caregiver burden among romantic partners and spouses of veterans with PTSD is related to greater PTSD symptom severity (Manguno-Mire et al., 2007). To date, support for interventions to reduce caregiver burden amongst family members while promoting TS recovery has been mixed (Erbes et al., 2019), although a meta-analysis examining the overall direction of effects have favored such interventions (Shepherd-Banigan, McDuffie, Shapiro, Brancu, Sperber, Mehta & Williams, 2018). Moreover, evidence to support Cognitive-Behavioral Conjoint Therapy for PTSD, a treatment designed to improve PTSD symptoms and relationship adjustment within couples, continues to grow (Fredman et al., 2019). The findings of the present study contribute support to the notion that CSO struggles in the face of posttraumatic symptomology may indeed be an important target within interventions designed to promote TS recovery from trauma.

The second hypothesis, that relationship satisfaction would be positively associated with support provision across support types when accounting for the trauma history, vicarious traumatization and depressive symptoms in CSOs, also found full support. Specifically, CSOs who reported dissatisfaction in their relationships even prior to the index event were also more likely to report providing less support, regardless of the social support type being examined. These findings align with past research suggesting that relationship health and social reciprocity impact support provision both for PTSD and other forms of psychopathology (Monson et al., 2009; Ybema, Kuijer, Hagedoorn & Buunk, 2002). Further, they resonate with prior work suggesting that CSO motivation to engage in prosocial, supportive behavior can be undermined – or enhanced – by the

relational context (van Stolk-Cooke, Hayes, Baumel & Muench, 2015). Collectively, these results provide evidence of construct validity for the SOEQ subscales.

The present study had several limitations. First, the pool of SOEQ candidate items was small when compared to the number of candidate items included in other comparable measure development and validation efforts (Fredericksen et al., 2018; Nick et al. 2018). For example, Fredericksen and colleagues (2018) adapted 72 candidate items from nine pre-existing measures of social support. By contrast, the SOEQ items were adapted from a single existing source – Cutrona and Suhr's (1992) qualitative coding schema. Though some recent measure development work has included a comparable number of candidate items to those included in the present study (Boateng et al., 2018), it is possible that we might have found more robust evidence for our social support type factors, and for a broader range of social support types, had we generated a larger pool of items from a longer list of existing measures. The process of developing candidate items from an exhaustive list of existing measures typically includes independent, qualitative coding of candidate items by a minimum of two trained qualitative researchers (Fredericksen et al., 2018), and was therefore beyond the scope of the current project. However, we are hopeful that the SOEQ will be the first of many efforts to improve measurement of supportive other experiences, and future psychometric endeavors in this domain should include a broader list of candidate items.

While results of CFA revealed a final, bifactor model of the SOEQ with good fit statistics, and robust factor loadings for the two process variables of interest, the pattern of factor loadings on support type factors was far from conclusive. While factor loadings on all support type latent variables were significant, several were quite small. Indeed,

following the guidelines of Guadagnoli and Velicer (1988), only the process factors could be interpreted as reliable based on the final factor loadings of the SOEQ. As such, items intended to capture unique social support types may benefit from further refinement.

Relatedly, there are limitations to the interpretability of all five latent factors included in the SOEQ as a function of the naming fallacy. The *naming fallacy* is the process whereby individuals assume that the name of a given construct is equivalent to its definition. Regardless of the social support measure being examined, it is important to recognize that the latent variables under scrutiny are not comprehensive representations of a given support process, support type, or indeed the broader construct of *social support*. The SOEQ Frequency factor can be interpreted as a relative indication of the amount of supportive behavior enacted, and the SOEQ Difficulty factor can be interpreted as a relative indication of effort or demand that enacting a given behavior places on the CSO. At best, the SOEQ Informational, Tangible, and Emotional factors are an indication of *some facets of a CSO's experience* of enacting behaviors characteristic of each of these support types – *they do not represent the support types themselves*. Thus, interpretation of SOEQ scores should integrate these nominal limitations. Indeed, all researchers of social support would do well to employ precise and specific language about what measurements of this construct are actually capturing.

Although the present study yielded evidence of psychometric validity of the SOEQ, there were some limitations to establishing reliability. First, we examined the performance of the SOEQ in a single, online sample surveyed cross-sectionally. As such, we were unable to establish test-retest reliability, or reliability across separate population samples. Cronbach's alpha values of internal consistency were used as an indicator of

reliability. Results suggested excellent internal consistency for the SOEQ Total Frequency and Difficulty subscales, and good internal consistency for the majority of SOEQ support type subscales. However, Informational and Tangible Support Frequency subscales had only acceptable internal consistency, suggesting that items within these categories may not be as closely related as items used to score the other SOEQ subscales. Further research is needed to establish the reliability of the SOEQ, and future work should therefore examine its performance longitudinally, and in separate samples.

The present study relied exclusively on CSO self-reports. What is more, CSOs provided all data on TS trauma exposure, posttrauma psychopathology, and recovery. Self-report measures are prone to bias, and historically the magnitude of correlations between responses from multiple informants have been moderate to low (De Los Reyes et al., 2015). TS experiences that are captured by a collateral reporter, as was the case for this study, should be interpreted with caution. Future work would benefit from a multi-informant design.

Though CSOs reported their impressions of several relevant time points (i.e., peritrauma, the acute posttrauma period, and present), the data for the present study was cross-sectional, and thus subject to recency effects and hindsight bias. Longitudinal research studies are needed to determine if the relations identified in the present study, such as the influence of CSO difficulty with support provision on TS recovery, replicate.

Relationships examined in the present study were limited to romantic dyads including a traumatically injured TS. Thus, a broad range of common CSO-TS relationships (e.g., parent-child, friends, siblings) went unrepresented, while a range of commonly experienced traumatic events went un- or underrepresented, such as

interpersonal trauma. Future work examining other CSO-TS relationships and a wider range of trauma is needed. As with the majority of social sciences research conducted on MTurk, demographic minorities are also underrepresented in the present study, limiting the generalizability of the findings.

To our knowledge, this study represents the validated self-report measure of social support from the perspective of the CSO. Using CFA to inform item and factor selection, the final version of the SOEQ demonstrated promising psychometric properties. The ability to dependably assess social support from the provider perspective has several implications for future research on social processes in recovery, both within and beyond the context of trauma. While there have been several recent efforts to build interventions specifically for CSOs, and successful efforts to integrate CSOs as stakeholders in TS treatment, these interventions have skipped an important exploratory step of identifying what CSOs are doing naturalistically. The SOEQ can potentially provide information about what factors differentiate CSOs who struggle to provide adequate social support from those who seem to thrive in a support provision role. Identifying what constitutes high-quality, sustainable social support from the CSO perspective can inform intervention development and refinement for both CSOs and their loved ones.

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APPENDIX A: SOEQ CANDIDATE ITEMS

1. I offered my partner ideas, gave advice, or suggested action steps.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

2. I referred my partner to an expert or some other source of help/support.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

3. I tried to put my partner's situation in a new light to make it less overwhelming or scary.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

4. I gave my partner information, facts or news about the situation or the recovery process.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

5. I provided my partner with material needs or services (e.g. an extra blanket at night, a loan of money, etc.).

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

6. I performed tasks directly related to my partner's recovery (e.g. driving them to doctor's appointments).

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

7. I took over one or more of my partner's other responsibilities while they were recovering (e.g. chores).

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

8. I joined my partner in actions that reduced their stress.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

9. I helped my partner with whatever they needed or asked me for.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

10. I highlighted positive things about my partner, like his or her strengths, abilities and successes.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

11. I agreed with my partner's perspective on his or her situation, and tried to emphasize that I was on his or her side.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

12. I did everything I could to make my partner feel less guilty about what happened.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

13. I made it as easy as possible for my partner to connect with his or her friends and family.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

14. I offered/provided my partner with access to new companions.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

15. I spent more time with my partner and made an effort to physically be there for him or her.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

16. I helped my partner to reach out to others who had been through similar experiences.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

17. I provided love and affection to my partner. When necessary, I provided reassurance about the strength of our relationship.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

18. I gave my partner physical affection (e.g. hugs, hand-holding, kisses).

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

19. I maintained my partner's privacy and, when asked, kept our conversations in confidence.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

20. I expressed sorrow, regret, and sympathy for my partner's situation.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

21. When my partner needed to talk, I listened attentively and without interrupting.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

22. I showed my partner that I understand his or her situation. When relevant, I shared personal experiences that I believed were similar.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

23. I tried to help my partner feel more hopeful and boost his or her confidence.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

24. I was encouraging, providing my partner with praise for his or her hard work and/or successes.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

25. I prayed for my partner.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

APPENDIX B – FINAL SOEQ ITEMS

1. I offered my partner ideas, gave advice, or suggested action steps.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

2. I gave my partner information, facts or news about the situation or the recovery process.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

3. I provided my partner with material needs or services (e.g. an extra blanket at night, a loan of money, etc.).

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

4. I performed tasks directly related to my partner's recovery (e.g. driving them to doctor's appointments).

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

5. I took over one or more of my partner's other responsibilities while they were recovering (e.g. chores).

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

6. I joined my partner in actions that reduced their stress.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

7. I provided love and affection to my partner. When necessary, I provided reassurance about the strength of our relationship.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

8. I gave my partner physical affection (e.g. hugs, hand-holding, kisses).

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

9. I maintained my partner's privacy and, when asked, kept our conversations in confidence.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

10. When my partner needed to talk, I listened attentively and without interrupting.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8

11. I was encouraging, providing my partner with praise for his or her hard work and/or successes.

How often did you do this?

Almost never				*Sometimes*				*All the time*
0	1	2	3	4	5	6	7	8

How effective was it?

Not at all				*Somewhat*				*Very*
0	1	2	3	4	5	6	7	8

How hard was it to do this?

Very easy				*Moderate*				*Very hard*
0	1	2	3	4	5	6	7	8